MD EXPLORER

Ground Based Maintenance Computer (GBMC)

User Guide

For use with:

GBMC Software, Part Number 900G9720006-103
IIDS Interface Cable, Part Number 900G8930003-101

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IIDS Functions

The Integrated Instrumentation Display System (IIDS) provides for the monitoring and display of aircraft system parameters along with the caution and warning annunciation requirements to meet FAR Part 27 certification requirements. Additionally, the IIDS, in conjunction with the Electronic Engine Controller (EEC), has access to information about aircraft system parameters and retains this data in non-volatile memory.

The Aircraft Systems Condition Monitoring (ASCM) function collects data about the operation of the aircraft and makes this data available to the operator for direct display viewing or download to the GBMC for maintenance recording and trend analysis. Specifically, engine parameters can be monitored during any engine operating condition and used for computerized tracking of engine hours and cycles. The decision to monitor any of these additional conditions is based on the operator's economic evaluation and experience. Engine parameter data is used by the Helicopter Engine Condition and Trend Monitoring (HECTM™) program within the GBMC.

The Balance Monitoring System (BMS) function within the IIDS provides for input signal conditioning, computations, data storage, and communication with ground based computer systems for main rotor and NOTAR® fan balance monitoring. The primary purpose of the BMS is to provide the helicopter user the with a simple and convenient means of acquiring the information needed to minimize cabin vibration caused by mass and aerodynamic imbalance in the main rotor and NOTAR® fan system.

Philosophy For Use Of IIDS/GBMC For Maintenance And Records Keeping

A philosophy for using the aircraft system data from the IIDS ASCM and BMS functions to support helicopter maintenance and records keeping is described below.

NOTE: The GBMC program is provided to ***assist*** the Owner/Operator in maintaining the MD Explorer and is not intended as a substitute for the maintenance of Rotorcraft and Engine records or for the performance of procedures as outlined in the operator or maintenance manuals for the Rotorcraft, Engines or other installed equipment.

1. The IIDS does not take on the function of the "Electronic Log Book"; the Engine and Aircraft Log Books are the primary records of the aircraft. The engine operational analysis data that the IIDS provides will help the operator in maintaining his engine and aircraft log books with a minimum of effort.
2. Exceedance events as recorded and annunciated by the IIDS will alert the operator, at which time the operator will log the exceedance in the log books and reference the maintenance manual for the appropriate maintenance action.
3. The IIDS assists in meeting the FAR requirement for providing a means to perform power assurance checks (if required by an operating rule) on the aircraft engines by providing for the data collection, calculation, and display of power assurance margins. The results can then be recorded in the engine log book.
4. The IIDS provides engine component life accounting by providing for the data collection, calculation, and display of engine component cycle counts. The Maintenance Manual and/or the Service Bulletin will outline the appropriate maintenance action.
5. The IIDS BMS functions assist in Main Rotor and NOTAR® smoothing by providing for the data collection, calculation, and display of balance corrective action adjustments and vibration alerts. The results can then be recorded in the aircraft log book.

6. The use of the IIDS to perform ASCM and BMS functions is not essential to aircraft operation since these functions can be performed manually as per the Aircraft and/or Engine Maintenance Manuals. The aircraft can be dispatched without these functions operating. In this case, all essential functions will have to be performed per procedures in the Aircraft and Engine Maintenance Manuals. The IIDS data base should then be updated with the current aircraft operational data when the IIDS function is repaired. The essential functions that can be performed by the IIDS or manually are the following maintenance practices:

    a. Engine parameter exceedance reporting
    b. Engine power assurance checks
    c. Component life usage assessment
    d. Engine and Aircraft Log Book entries
    e. Transmission parameter exceedance reporting
    f. Rotor parameter exceedance reporting
    g. Rotor/NOTAR vibration alerts

7. The use of this data collected by the IIDS is at the discretion of the operator. No requirement is imposed on the operator to view this data on the IIDS display or download it to a ground based computer. The ground based computer system contains the Helicopter Engine Condition Trend Monitoring (HECTM™) program that is developed by the engine manufacturer. Therefore, any download requirement for the ASCM data to support the HECTM™ function is determined by the engine manufacturer.

8. Initialization of the IIDS Setup Data is not required for aircraft operation. The IIDS can perform its systems monitoring and display functions without being initialized. However, if not initialized, various engine related ASCM functions (exceedance, fault, and power assurance) will be disabled. This is to provide IIDS replacement and aircraft dispatchability in remote locations. The IIDS can be initialized (setup) at a later date when a ground based computer becomes available.

Ground Based Maintenance Computer Functions

The GBMC program provide Owner/Operators with the ability to upload, download, display, and archive Integrated Instrument Display System (IIDS) data logs. In addition, the Setup Log and the Cumulative Log are editable by persons with Full User or System Administrator access to allow uploading of initialization and configuration data.

ASCM Log Files

Setup Log and **Cumulative Log** contents are cover in more detail in the **Creating Or Modifying Uploadable Setup Or Cumulative Data Files** paragraphs.

There are six types of data records maintained by the ASCM: 1) Data Log, 2) Exceedance Log, 3) Fault Log, 4) Trend Log, 5) Cumulative Log, and 6) Setup Log. The content of these records can be downloaded to a PC through a RS-232C interface, using the GBMC program. A subset of these records can be displayed on the alphanumeric display on the IIDS (Ref. Rotorcraft Maintenance Manual)

Data Log

This type of record provides one and a half (1.5) minutes of data collection. The data is recorded in a continuous memory buffer "loop" and will be continuously overwritten unless an exceedance occurs, or when a discrete signal from the crew (**REC** key on IIDS) requests a record of an event . This record is meant to provide a "window" in time by allowing a more detailed look at events around an exceedance or other incident. The capability is provided to store up to five of these Data Logs. A description of this log can be found in the Appendix.

Exceedance Log

An Exceedance Log provides a "snapshot" record of the parameter data at a particular moment in time. This type of record occurs whenever a parameter exceedance is detected. The capability is provided to store up to 100 of these Exceedance Logs. A description of this log can be found in the Appendix.

Fault Log

This Fault Log contains data associated with the fault discrete data from the EECs and a BIT failure that was detected in the IIDS, BMS, or aircraft transducers/sensors. This type of log is recorded whenever an IIDS or EEC fault is detected. The capability is provided to store up to 100 of these Fault Logs. A description of this log can be found in the Appendix.

Trend Log

The Trend Log is another "snapshot" type record that records certain aircraft data under given operational conditions and is generated by a Power Assurance check request. After the aircraft has reached the specific operational condition, data is taken for 30 seconds (Pratt and Whitney) or two minutes (Turbomeca), averaged over 15 seconds, and placed in the Trend Log. The data sample rate during this one minute collection period is one per second. This data serves three purposes: data for ground based trending of aircraft parameters, engine performance analysis, and vibration spectrums. Trend spectrums are generated by the BMS via a request to perform a Power Assurance check. These spectrums are linked to the Trend Logs and become part of the trending data used by the ground based computer. The capability is provided to store up to 100 of these Trend Logs (excluding the trend Spectrum Logs). A description of this log can be found in the Appendix.

Cumulative Log

The Cumulative Log contains data associated with the aircraft configuration and operational analysis. A description of this log can be found in the Appendix.

Setup Log

The IIDS is initialized by entering information through the RS-232C Maintenance Computer interface, J1. Initialization parameters and their ranges of values described in the Appendix. A copy of the Setup Data information can be downloaded, but will not be overwritten except when specifically updated or erased. Suitable password protection and/or queries requesting confirmation is provided in the GBMC software to prevent accidental deletion or modification of data.

BMS Data Files

There are seven types of data files maintained by the BMS: 1) Advisory Log, 2) Spectrum Log, 3) BMS Version/Fault Log, 4) Main Rotor Balance Log, 5) NOTAR Balance Log, and 6) two setup files, the BMS Setup Log and Vibration/Balance Model Log. All logs can be transferred to the Ground based Maintenance Computer (GBMC) via the IIDS RS-232C serial link, while a subset of these records can be displayed on the alphanumeric display on the IIDS (Ref. CSP-900RMM-3, Rotorcraft Maintenance Manual) All data records are time and date stamped.

Advisory Log

The Advisory Log contains alert messages for vibration levels that have been exceeded.

Spectrum Log

The Spectrum Log contains two types of spectrum data.

1. 400 line spectra (random) recorded by pressing the **REC** key while in the **RANDOM SPECTRUM** menu selection on the IIDS.
2. Reduced set of FFT frequencies (trend) recorded by a Power Assurance check request. This log is "linked" to the Trend Log generated by the Maintenance Processor when a Power Assurance check is performed.
3. Trend spectra based upon set flight conditions recorded by pressing the **REC** key (on the IIDS) while in the IIDS **TREND SPECTRUM** menu selection.

BMS Version/Fault Log

The BMS Version/Fault Log contains failure messages/codes from the BMS BIT and BMS hardware and software versions and part numbers.

Main Rotor Balance Log

The Main Rotor Balance Log contains the main rotor configuration, balance measurements, adjustments, and options.

NOTAR® Balance Log

The NOTAR® Balance Log contains the NOTAR® fan configuration, balance measurements, and adjustments.

BMS Setup Files

Two types of setup files can be uploaded to the BMS: (1) The Vibration/Balance Model Log, which resides in Flash ROM memory, and (2) The BMS Setup Log, which resides in battery-backed RAM memory.

The setup files can only be transferred to the IIDS via the GBMC (System Administrator level password access). The integrity of this upload operation is verified by the overall memory checksum which is always zero. The BMS VERSION LOG menu is accessed through the IIDS front panel keys and/or the BMS Version/Fault Log (which contains all system configuration versions), which can be downloaded and inspected for the correct part numbers, version numbers and checksums.

BMS Setup Log

Definition of the spectrum data acquisition (Trend, Random and PA spectrums) can be changed by uploading a BMS Setup Log into battery-backed RAM. Once uploaded, these operations become the default unless the RAM data is lost. In this case, the operations revert back to the defaults that were stored in Flash ROM. A description of this log can be found in the Appendix.

GBMC User Levels

Limited User Functions

Functions are provided at three different levels. The base level of functionality provides for download only (Limited User level). This allows maintenance personnel to extract all the available (downloadable data) into the GBMC to assist in logbook management and rotorcraft/engine maintenance. Users at this level are not allowed to upload any data to the IIDS from the GBMC.

Full User Functions

This level of functionality provides the Owner /Operator with all the limited user functions, plus the ability to modify or create Setup Data files and upload this data into the IIDS. This level user can also perform file archive and restore operations.

System Administrator Functions

This level of functionality is reserved for authorized MDHI personnel only. It is intended to provide the capability of uploading BMS balance models used by the IIDS to perform Main Rotor/NOTAR Fan balance calculations. ***This function can only be performed by MDHI authorized personnel.***

Program Installation Requirements

This software is designed to run on a computer running the Windows® XP Operating System or newer. The computer must have a hard disk drive with a minimum of 20 megabytes of free disk space and a minimum of 4 megabytes of RAM. While the program is designed to be used with either a keyboard or mouse, a mouse is strongly recommended.

Setup

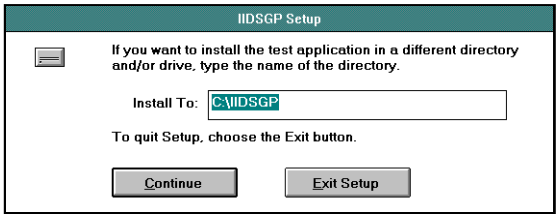
Insert the disk containing the Ground Based Maintenance Computer (GBMC) program in drive "**A**:" and select the "**Run**" command from the windows File Manager. In the dialog box, type "SETUP.EXE" and press **ENTER**.

The program will begin to install and a dialog box will prompt you for the directory name you wish to install the program to. If you do not have a specific location to install to, accept the default directory and press the continue button. The "Setup" program will create an "**IIDSGP**" and "**IIDS**" directory on your hard disk.

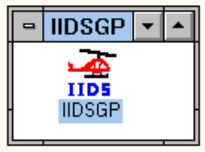
NOTE: If you do not know where to install the program, follow the directions on the screen and accept the default settings.

The "**IIDSGP**" directory contains the GBMC programs and the "**IIDS**" directory will be used to store the rotorcraft log and setup data files.

When the installation program is complete, there will be a new "group" in the Program Manager window titled **IIDSGP**. This group will contain the GBMC program icon.


IIDSGP Setup
If you want to install the test application in a different directory and/or drive, type the name of the directory.
Install To:
C:\IIDSGP
To quit Setup, choose the Exit button.
Continue
Exit Setup

IDDSGP Setup Dialog



Program Manager Group

Creating BMS Directory

The GBMC software requires that a "**BMS**" directory be created to store files for the Chandwick-Helmuth Balance Monitoring System application (separate files on the GBMC disk). To create this directory:

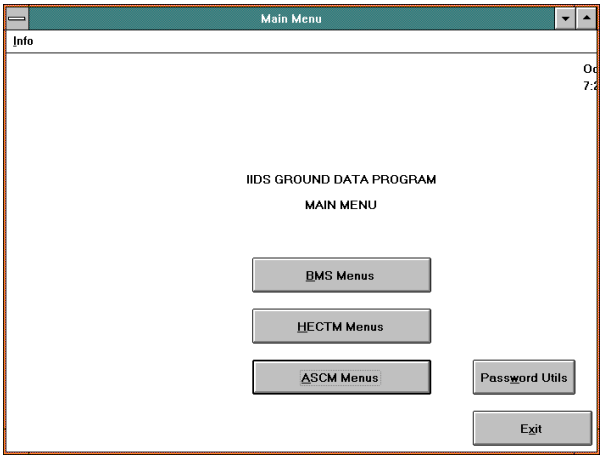
1. Select from the "**File**" menu, the "**Create Directory**" option, type directory name "C:\BMS" and press **ENTER** key.
2. Select from the "**File**" menu, the "**Copy**" option and type in the '**From**' field "A:\BMS*.*" and type in the "To" field "C:\BMS*.*"
3. Press the **ENTER** key.

GBMC Main Menu Screen

When logon is successful, the GBMC main menu is visible. From here you can select all the function available in the application. The menu consists of buttons for accessing the:

BMS Menus, **ECTM Menus**, **ASCM Menus**, **Password Utils** and **Exit**

The BMS Menus and ECTM Menus buttons provide the ability to launch the Chandwick-Helmuth BMS program and the Pratt & Whitney programs respectively. The ASCM Menus button accesses the IIDS maintenance functions.



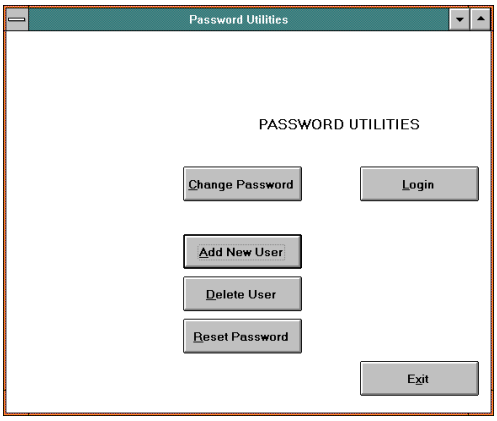
Password Utilities

Change Passwords

TIP: The operator can be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

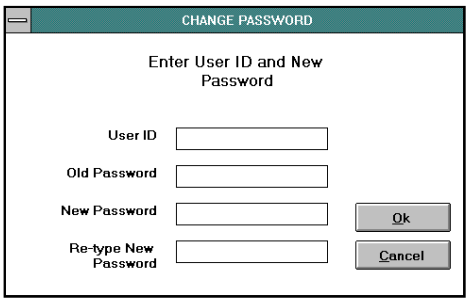
This function is used to allow established users (logon privileges already assigned) to change their existing passwords to new passwords.

1. Click on the "**Password Utils**" control button.



2. Click on the "**Change Password**" control button.
3. Use **TAB** key (or mouse) to select User ID field
4. Enter User ID

5. Use **TAB** key (or mouse) to select Old Password field
6. Enter current password
7. Use **TAB** key (or mouse) to select New Password field
8. Enter new password
9. Use **TAB** key (or mouse) to select re-type New Password field
10. Enter new password
11. Click on the "**Ok**" control button



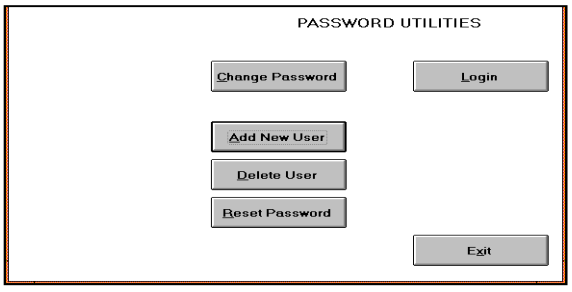
12. A status message will be displayed, indicating the success of the password change.

Add New Users

TIP: The operator must be logged into the IIDSGP as either a Full User or System Administrator to have access to this function. The Full User may only add a new user as "Full User" or "Limited User" access.

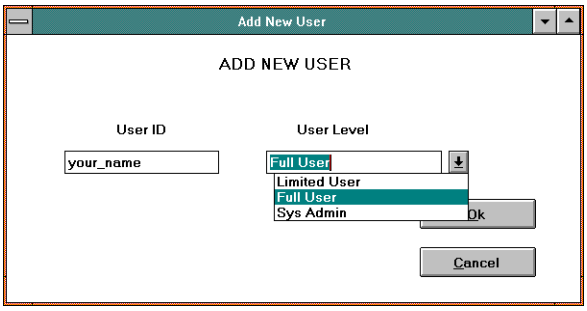
This function allows the system administrator to authorize personnel as Limited Users, Full Users or System Administrators. Personnel that have Full User authorization can establish others as Limited Users or Full Users.

1. Click on the "**Password Utils**" control button.
2. Click on the "**Add New User**" control button.



3. Use **TAB** key (or mouse) to select User ID field
4. Type in new user's ID
5. Use **TAB** key (or mouse) to select User Level field
6. Use (↑↓) arrows keys to select user level (Limited User, Full User, or System Administrator)
7. Click on the "**Ok**" control button.
8. A status message will be displayed, indicating the success of the addition of the user.

NOTE: The user will have the default password, "**PASSWORD"**.

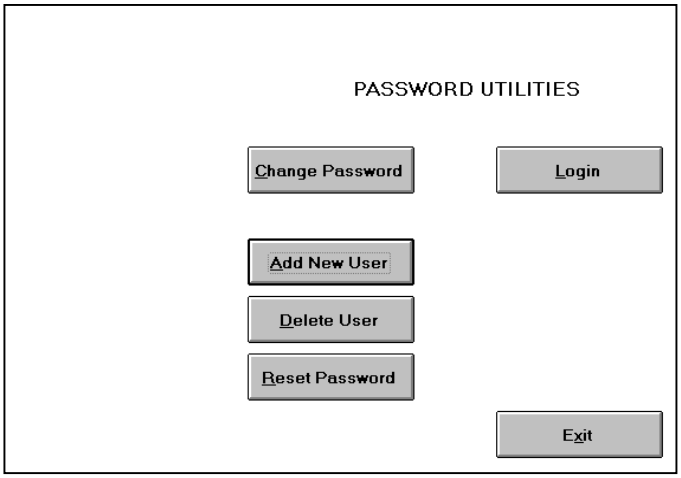


Delete Users

TIP: The operator must be logged into the IIDSGP as either a Full User or System Administrator to have access to this function. The Full User may only delete a Limited User or Full User access.

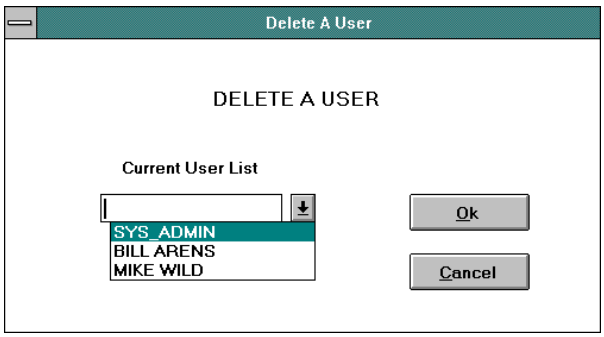
This function allows the System Administrator to delete “all levels of users” from the access authorization list. Personnel that have Full User authorization can delete “Limited User” or “Full Users” from the access authorization list.

1. Click on the "**Password Utils**" control button.
2. Click on the "**Delete User**" control button.



3. Use **TAB** key (or mouse) to select User ID field.
4. Use (↑ ↓) arrows keys to select user ID that is to be deleted.
5. Click on the "**Ok**" control button.

6. A status message will be displayed, indicating the success of the deletion of the use user.

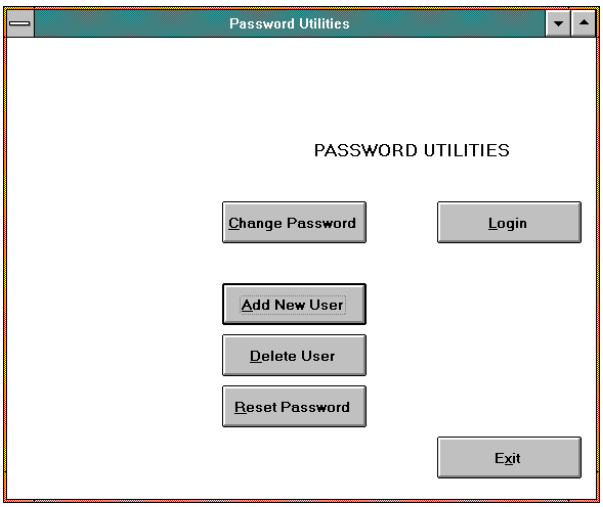


Reset Passwords

TIP: The operator must be logged into the IIDSGP as either a Full User or System Administrator to have access to this function. The Full User may only reset the password of a "Limited User" or "Full User".

This function allows the System Administrator to reset "all levels of user passwords". Personnel that have Full User authorization can reset "Limited User" or "Full Users" passwords. The default password will be "**PASSWORD**". After resetting the password, the user should change his or her password to something other than the default "**PASSWORD**"

1. From the GBMC Main Menu, Click on the "**Password Utils"** control button.
2. Click on the "**Reset Password"** control button.



3. Use **TAB** key (or mouse) to select User ID field.
4. Use (↑ ↓) arrows keys to select user ID that is to have their password reset.
5. Click on the "**Ok**" control button.

6. A status message will be displayed, indicating the success of the password resetting.

   NOTE: The default password after being reset is **PASSWORD**.

7. The user whose password has been reset to the default “PASSWORD” should now enter a new password by following the steps in the Change Passwords paragraph above.

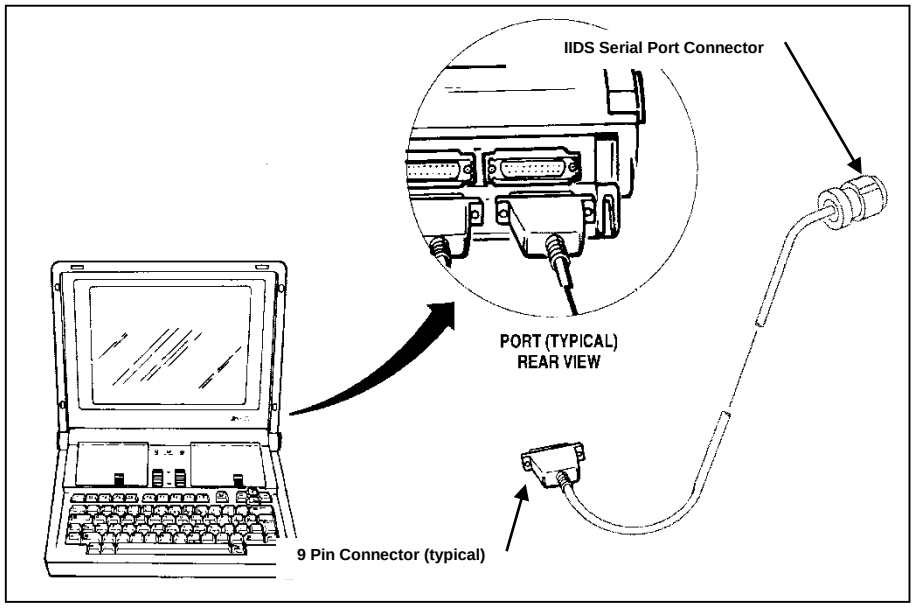
Connecting The GBMC Computer To The IIDS

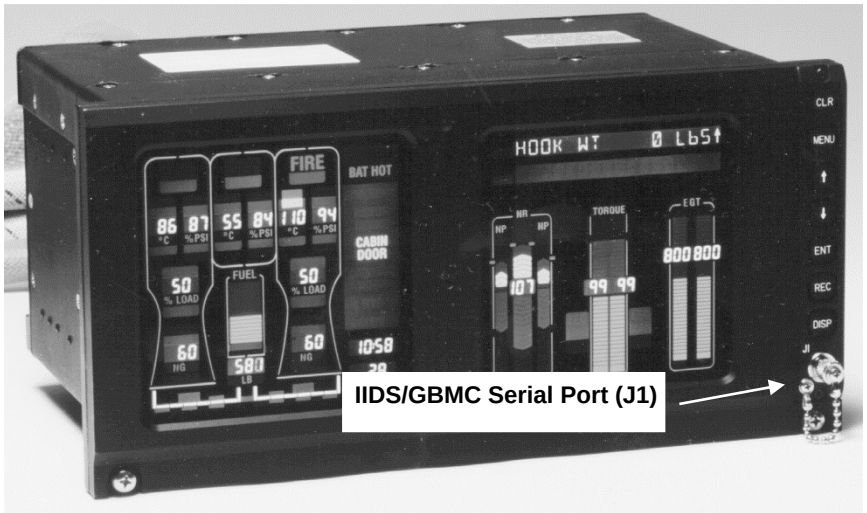
The GBMC must be connected to the IIDS using the IIDS Interface Cable (Part Number 900G8930003-101), to perform upload and download functions. To connect the GBMC:

NOTE: A USB to Serial converter cable may be used with computers that do not have a 9 Pin (RS-232) connector. The GBMC software has been tested to work with the IOGear USB to Serial RS-232 Adapter Model GUC232A. Other adaptor brands may work but have not been tested. Install the software for the GUC232A before using the GBMC software.

1. Connect the 9 Pin connector to the back of the computer at serial port "1".
2. Connect the special round serial port cable connector to the **J1** port on the front of the IIDS display.

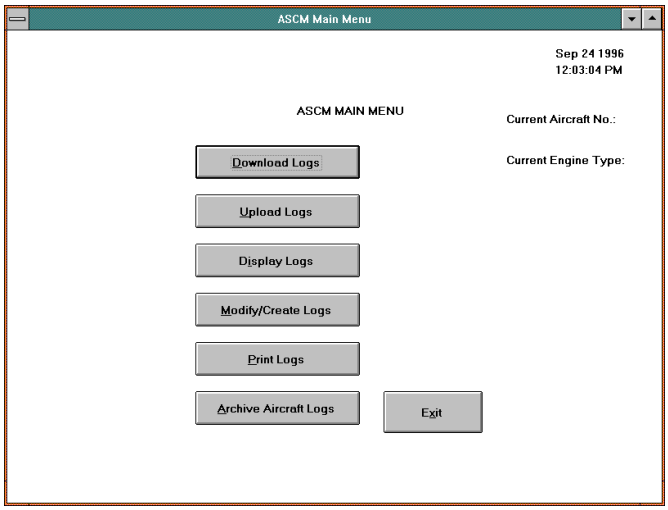
   NOTE: Refer to the appropriate sections of this guide for procedures on uploading and downloading files.





Aircraft Systems Condition Monitor (ASCM) Menu

The ASCM menu provides functions for downloading, uploading, modify/create, displaying and archiving of logs.



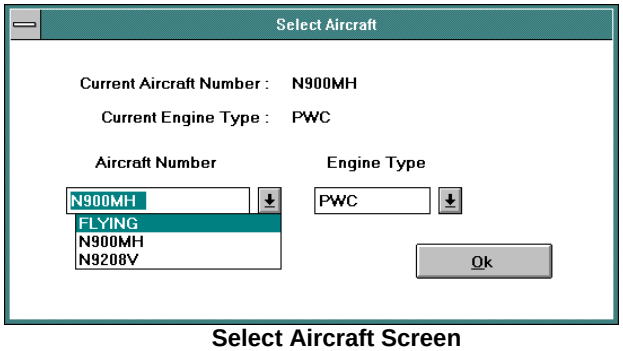
NOTE: The **Upload Logs** and **Modify/Create Logs** menu selections will be disabled (not selectable) to users logged on as "Limited Users".

Downloading Files From The IIDS

This procedure provides functions for downloading **Data Logs, Exceedance Logs, Fault Logs, Trend Logs**, **Cumulative Logs** and **Setup Logs** from the IIDS. To download BMS logs, refer to the **BMS Menu** Paragraphs.

TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

1. Connect the GBMC to the IIDS (Ref. Connecting the GBMC Computer To The IIDS).
2. Click on the "**ASCM Menus**" control button.
3. Click on the "**Download Logs**" control button.



Select Aircraft Screen

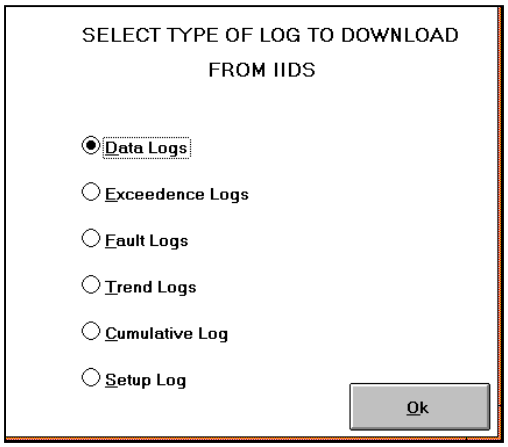
4. In the Select Aircraft Screen, use **TAB** key (or mouse) to select the Aircraft Number field.
5. Either type in a new aircraft number or select one from the drop down list.
6. Press **Ok**.

7. In the Download ASCM Logs Screen, either:

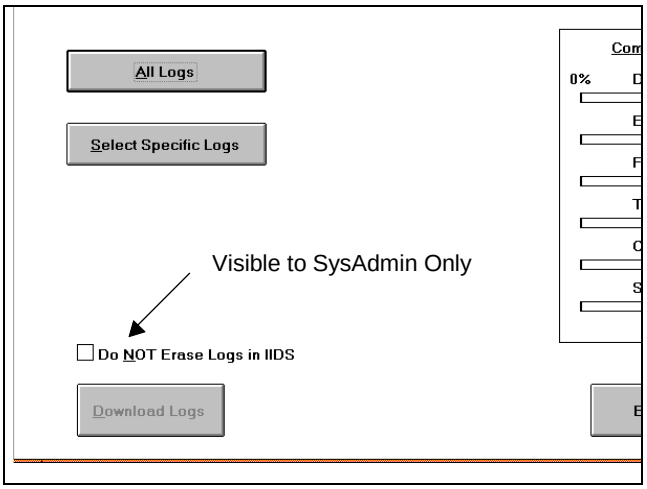
   a. Click on the "**All Logs**" control button to download all logs of all log types from the IIDS or:

   b. Click on the "**Select Specific Logs**" control button to download all the logs of a specific type.

   c. Select the type of file to download; **Data, Exceedance, Fault, Trend, Cumulative** or **Setup,** and click on the "**Exit**" control button.



"Select Logs Types" Screen

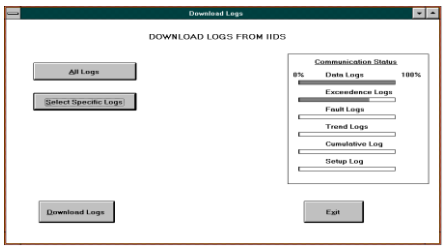


"Download Logs" Screen

*TIP: When logged in as a **System Administrator**, click on the "Do Not Erase Logs In IIDS" control button if you **DO NOT** want to erase the logs in the IIDS. By default all Data, Exceedance, Fault and Trend Logs will be erased from IIDS memory after they are downloaded.*

   d. Click on the "**Download Logs**" control button. The Download Logs screen will reappear and the Communications Status bars will indicate the progress of the download. When complete a message box will appear confirming successful completion.

NOTE: When logs are downloaded from the IIDS and log files already exist in the aircraft database for the specified Aircraft number, the original files are labeled " ***.bak*** " and the newly downloaded files are labeled "***.dn***".



Communications Status

8. After the files have transferred the IIDS alpha-numeric display will show the message "**DATA XFER CMPL**". Press **Exit** to return to the **ASCM Main Menu**.

9. Disconnect the GBMC from the IIDS.

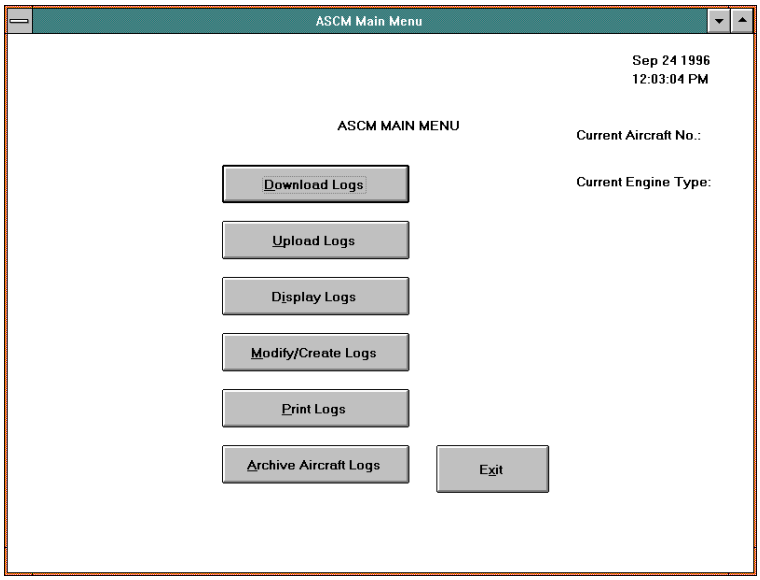
Uploading Files To The IIDS

File upload is used to initialize a new or replacement IIDS with the basic rotorcraft and engine parameters and installed components data. This function is also used when an engine or other installed equipment is changed.

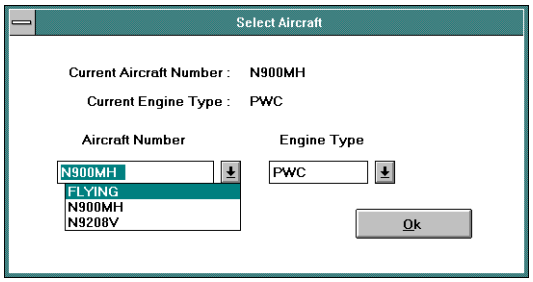
NOTE: You must perform the download procedures for the Setup Log or Cumulative Log before you can perform an upload. Each time a download is performed, a file is generated for the downloaded log with the "<log name>.dn" extension. If a file already exists with this name, a backup file with the "<log name>.bak" file name extension is generated for the existing "<log file>.dn". *If a* "<log name>.bak" *file already exists, it will be overwritten!* To prevent the inadvertent loss of a downloaded log file, you should archive the files after each download.

TIP: The operator must be logged into the IIDSGP as either Full User or System Administrator to have access to this function.

1. Connect the GBMC to the IIDS (Ref. Connecting the GBMC Computer To The IIDS).
2. Click on the "**ASCM Menus**" control button.
3. Click on the "**Upload Logs**" control button.

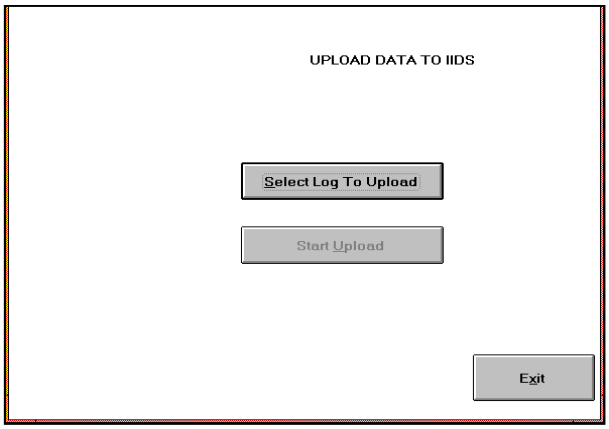


4. In the Select Aircraft Screen, user **TAB** key (or mouse) to select the Aircraft Number field.
5. Either type in a new aircraft number or select an old one by using the (↑ ↓) arrow keys (or use mouse to select via the drop down list).



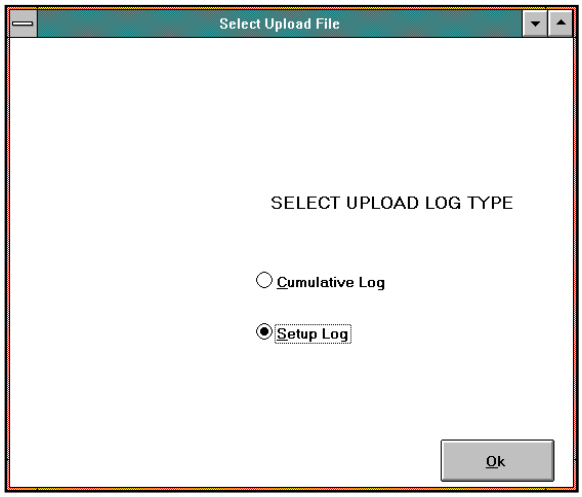
6. Click on the "**Select Log to Upload**" control button.

   NOTE: The **Start Upload** button will be disabled until a log has been selected to upload.

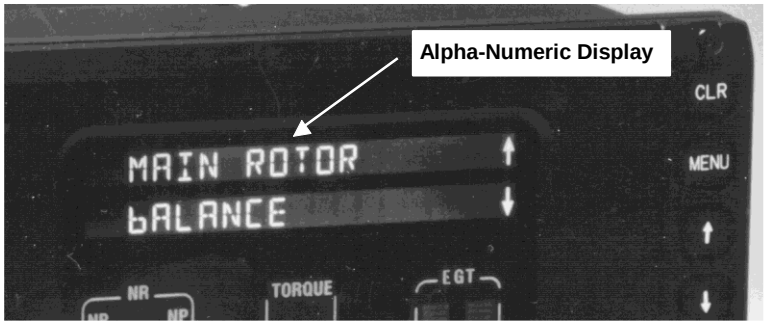


7. Select the type of file to upload (Cumulative or Setup log) and click on the "**Ok**" control button.

   NOTE: By default, all uploadable logs are named " ***.up*** " in the aircraft database. Refer to the Modify/Create Log paragraphs for procedures on generating a setup or cumulative log to upload.



8. Click on the "**Start Upload**" control button and wait for the indication that the communications has been completed successfully. When file transfer is complete the message "**DATA XFER CMPL**" will appear on the IIDS alpha-numeric display.



IIDS Alpha-Numeric Display

NOTE: The IIDS must be rebooted to allow any changed parameters in the newly uploaded Setup or Cumulative log to become effective. Turn electrical power off then on again to reboot the IIDS processor.

9. Disconnect the GBMC from the IIDS.

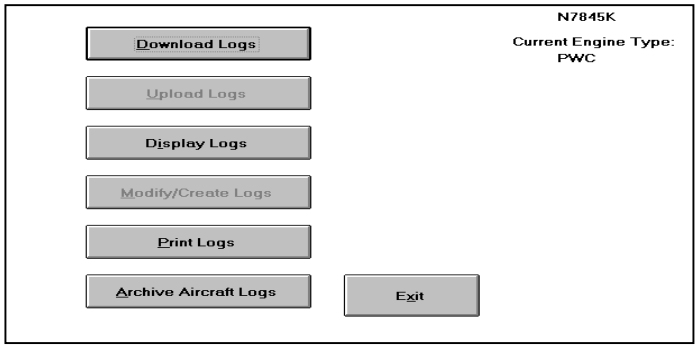
Displaying Log Files

The Display Logs option on the ASCM menu allows you to view the Data, Exceedance, Fault, Trend, Cumulative and Setup logs on the GBMC screen. This is a view only capability. A copy of the log being viewed can be printed from this function. The file can also be converted from its native binary format to an ACSII format for export. Converting the log to ACSII allows the Owner/Operator to incorporate the log data into other applications that support ASCII file formats. For a description of each log file type, refer to the Introduction section and the Appendix of this guide.

NOTE: Printing or ASCII conversion of logs being viewed applies only to the specific log displayed. For example, the Fault log can contain as many as 100 "logs" (entries). To print the entire contents of these types of logs, use the **ASCM Print Logs** menu selection.

TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

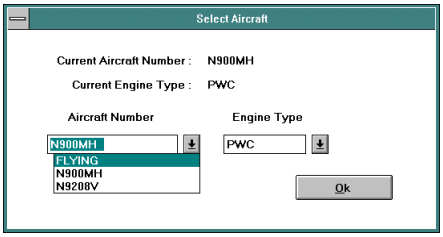
1. Click on the "**ASCM Menus**" control button.
2. Click on the "**Display Logs**" control button.



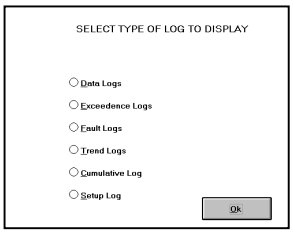
ASCM Menu Screen

3. In the Select Aircraft Screen, use **TAB** key (or mouse) to select the Aircraft Number field.

4. Either type in a new aircraft number or select one by using the (↑ ↓) arrow keys (or use mouse to select via the drop down list).



5. In the Select the "Type Of Log To Display" screen, select the log type to display, Data, Exceedance, Fault, Trend, Cumulative or Setup and click the "**Ok**" control button to continue.



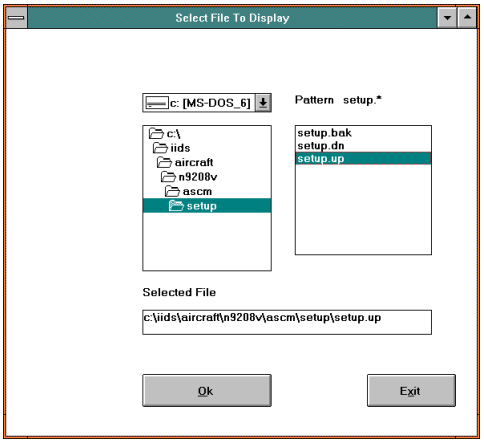
The Select File To Display Screen will become visible.

6. Either select the desired file with the mouse or :

   Use **TAB** key to select the file list control.

   Use (↑ ↓) arrow keys to select the desired file to edit.

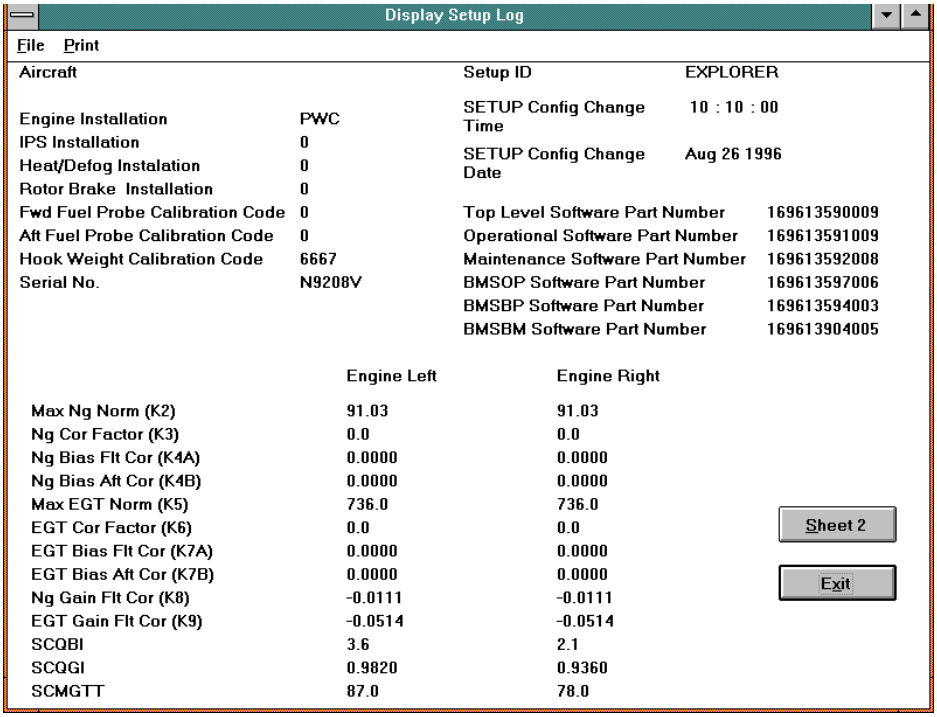
7. Click on the "**Ok**" control button to begin viewing logs.



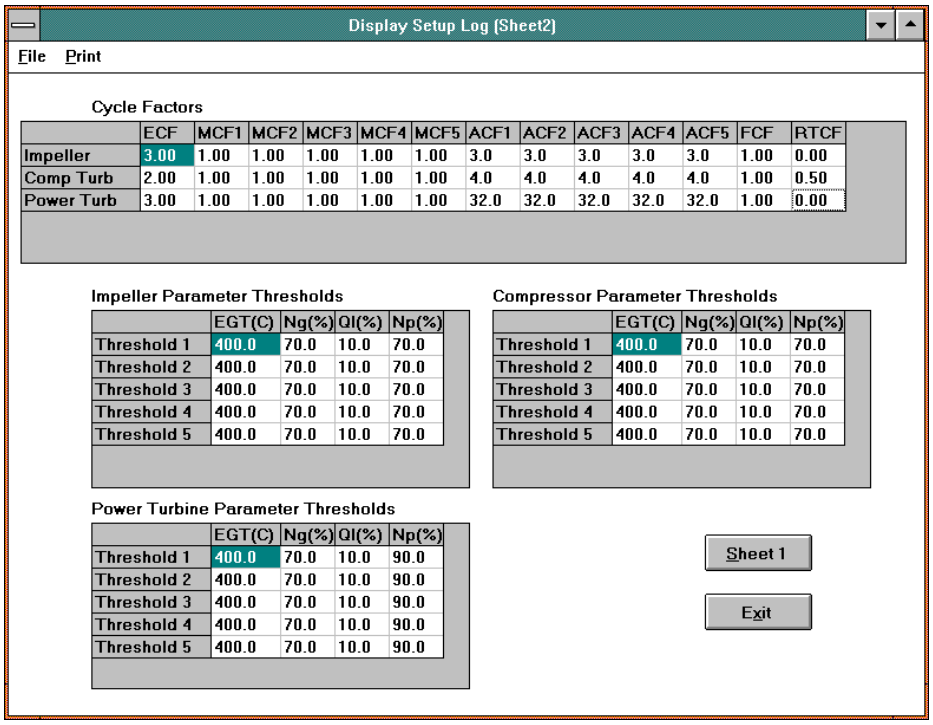
A display screen will appear containing the current data for each parameter.

NOTE: For the **Setup** and **Cumulative** log types two screens are required to display the complete log. Select the "**Sheet 2**" control button in the case of the "**Setup Log**" and the "**Right Engine**" control button in the case of the "**Cumulative Log**" to get to the second page.

Setup Log Displays

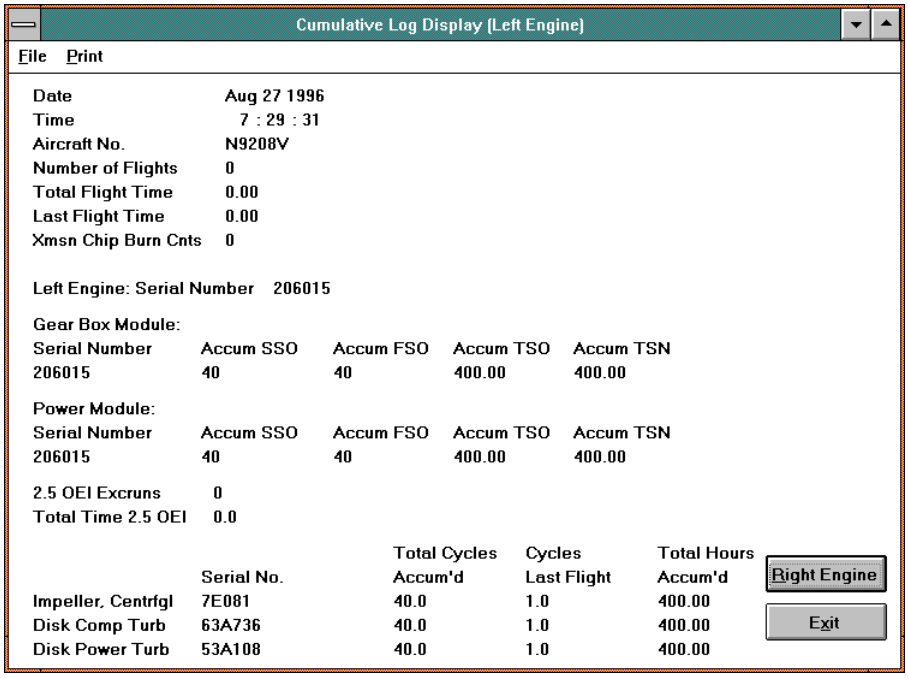

Display Setup Log
File Print
Aircraft
Setup ID EXPLORER
Engine Installation PWC
IPS Installation 0
Heat/Defog Instalation 0
Rotor Brake Installation 0
Fwd Fuel Probe Calibration Code 0
Aft Fuel Probe Calibration Code 0
Hook Weight Calibration Code 6667
Serial No. N9208V
SETUP Config Change Time 10 : 10 : 00
SETUP Config Change Date Aug 26 1996
Top Level Software Part Number 169613590009
Operational Software Part Number 169613591009
Maintenance Software Part Number 169613592008
BMSOP Software Part Number 169613597006
BMSBP Software Part Number 169613594003
BMSBM Software Part Number 169613904005
Engine Left Engine Right
Max Ng Norm (K2) 91.03 91.03
Ng Cor Factor (K3) 0.0 0.0
Ng Bias Flt Cor (K4A) 0.0000 0.0000
Ng Bias Aft Cor (K4B) 0.0000 0.0000
Max EGT Norm (K5) 736.0 736.0
EGT Cor Factor (K6) 0.0 0.0
EGT Bias Flt Cor (K7A) 0.0000 0.0000
EGT Bias Aft Cor (K7B) 0.0000 0.0000
Ng Gain Flt Cor (K8) -0.0111 -0.0111
EGT Gain Flt Cor (K9) -0.0514 -0.0514
SCQBI 3.6 2.1
SCQGI 0.9820 0.9360
SCMGTT 87.0 78.0
Sheet 2
Exit

Setup Log Display (Sheet 1 of 2)

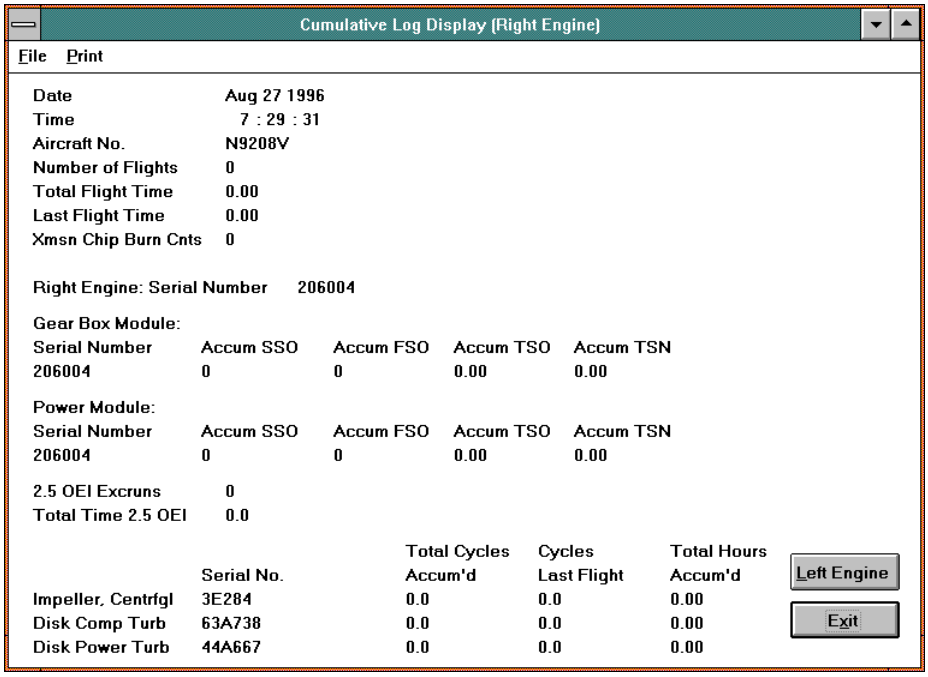

Display Setup Log (Sheet2)
File Print
Cycle Factors
ECF MCF1 MCF2 MCF3 MCF4 MCF5 ACF1 ACF2 ACF3 ACF4 ACF5 FCF RTCF
Impeller 3.00 1.00 1.00 1.00 1.00 1.00 3.0 3.0 3.0 3.0 3.0 1.00 0.00
Comp Turb 2.00 1.00 1.00 1.00 1.00 1.00 4.0 4.0 4.0 4.0 4.0 1.00 0.50
Power Turb 3.00 1.00 1.00 1.00 1.00 1.00 32.0 32.0 32.0 32.0 32.0 1.00 0.00
Impeller Parameter Thresholds
EGT(C) Ng(%) Ql(%) Np(%)
Threshold 1 400.0 70.0 10.0 70.0
Threshold 2 400.0 70.0 10.0 70.0
Threshold 3 400.0 70.0 10.0 70.0
Threshold 4 400.0 70.0 10.0 70.0
Threshold 5 400.0 70.0 10.0 70.0
Compressor Parameter Thresholds
EGT(C) Ng(%) Ql(%) Np(%)
Threshold 1 400.0 70.0 10.0 70.0
Threshold 2 400.0 70.0 10.0 70.0
Threshold 3 400.0 70.0 10.0 70.0
Threshold 4 400.0 70.0 10.0 70.0
Threshold 5 400.0 70.0 10.0 70.0
Power Turbine Parameter Thresholds
EGT(C) Ng(%) Ql(%) Np(%)
Threshold 1 400.0 70.0 10.0 90.0
Threshold 2 400.0 70.0 10.0 90.0
Threshold 3 400.0 70.0 10.0 90.0
Threshold 4 400.0 70.0 10.0 90.0
Threshold 5 400.0 70.0 10.0 90.0
Sheet 1
Exit

Setup Log Display (Sheet 2 of 2)

Cumulative Log Displays


Cumulative Log Display (Left Engine)
File Print
Date Aug 27 1996
Time 7 : 29 : 31
Aircraft No. N9208V
Number of Flights 0
Total Flight Time 0.00
Last Flight Time 0.00
Xmsn Chip Burn Cnts 0
Left Engine: Serial Number 206015
Gear Box Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206015 40 40 400.00 400.00
Power Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206015 40 40 400.00 400.00
2.5 OEI Excruns 0
Total Time 2.5 OEI 0.0
Serial No. Total Cycles Accum'd Cycles Last Flight Total Hours Accum'd
Impeller, Centrfgl 7E081 40.0 1.0 400.00
Disk Comp Turb 63A736 40.0 1.0 400.00
Disk Power Turb 53A108 40.0 1.0 400.00
Right Engine
Exit

Cumulative Log Display (Left Engine)


Cumulative Log Display (Right Engine)
File Print
Date Aug 27 1996
Time 7 : 29 : 31
Aircraft No. N9208V
Number of Flights 0
Total Flight Time 0.00
Last Flight Time 0.00
Xmsn Chip Burn Cnts 0
Right Engine: Serial Number 206004
Gear Box Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206004 0 0 0.00 0.00
Power Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206004 0 0 0.00 0.00
2.5 OEI Excruns 0
Total Time 2.5 OEI 0.0
Serial No. Total Cycles Accum'd Cycles Last Flight Total Hours Accum'd
Impeller, Centrfgl 3E284 0.0 0.0 0.00
Disk Comp Turb 63A738 0.0 0.0 0.00
Disk Power Turb 44A667 0.0 0.0 0.00
Left Engine
Exit

Cumulative Log Display (Right Engine)

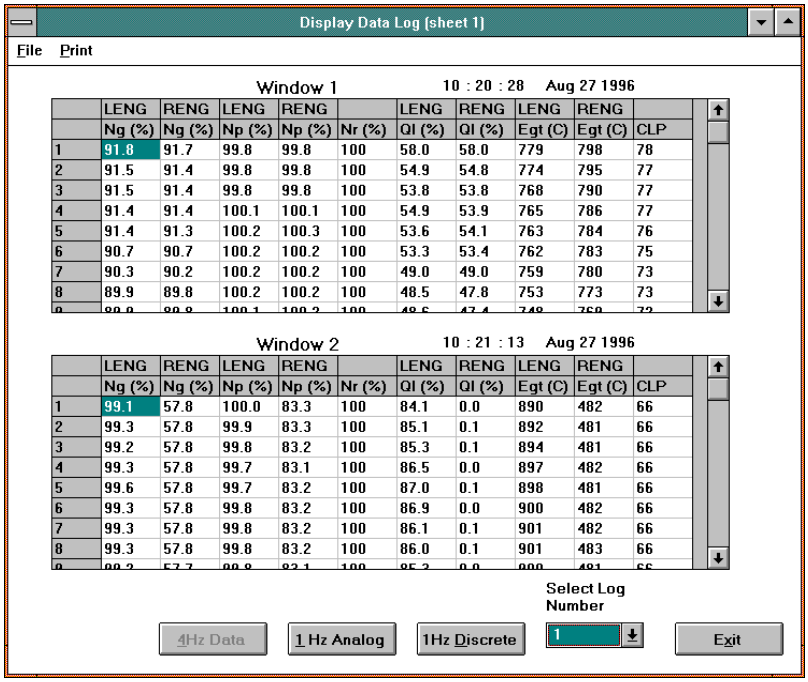
Data Log Display Formats

For the Data log type, the contents are displayed in three screens, **4Hz Data**, **1Hz Data** and **Discrete Data**.

Note: For the **Data, Fault, Trend** and **Exceedance** Log types there is a possibility of having more than a single log to be displayed. There is a drop down list control in the upper right hand corner of the screen that is used to select a new log number to be displayed. This may be accessed using the mouse or (↑ ↓) arrow keys.

8. Displayed log maybe printed by pressing the **<ctrl>+P** keys.
9. An ASCII file may be generated for the displayed log by typing **<ctrl>+F**.
10. Click the on the "**Exit**" control button to complete the log viewing function.

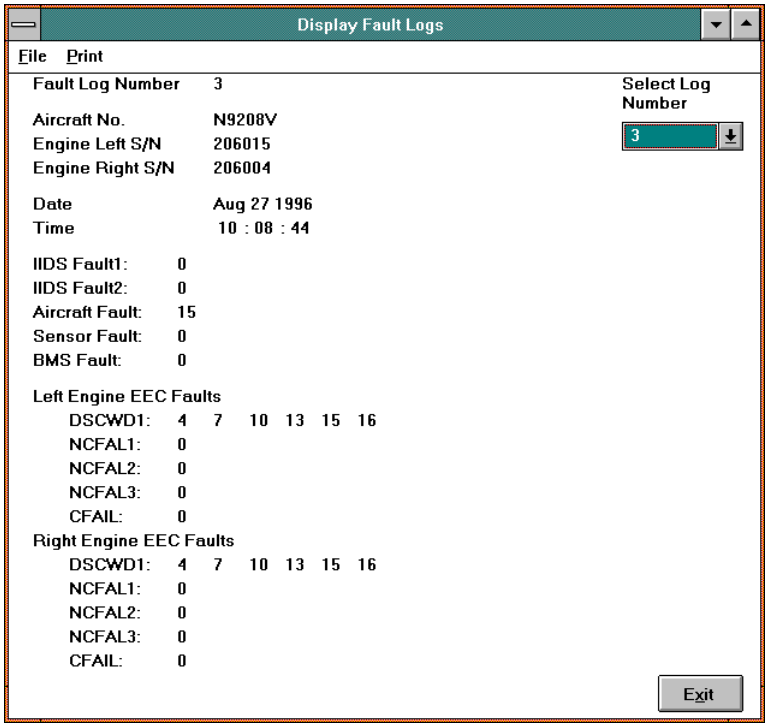
Data Log Displays



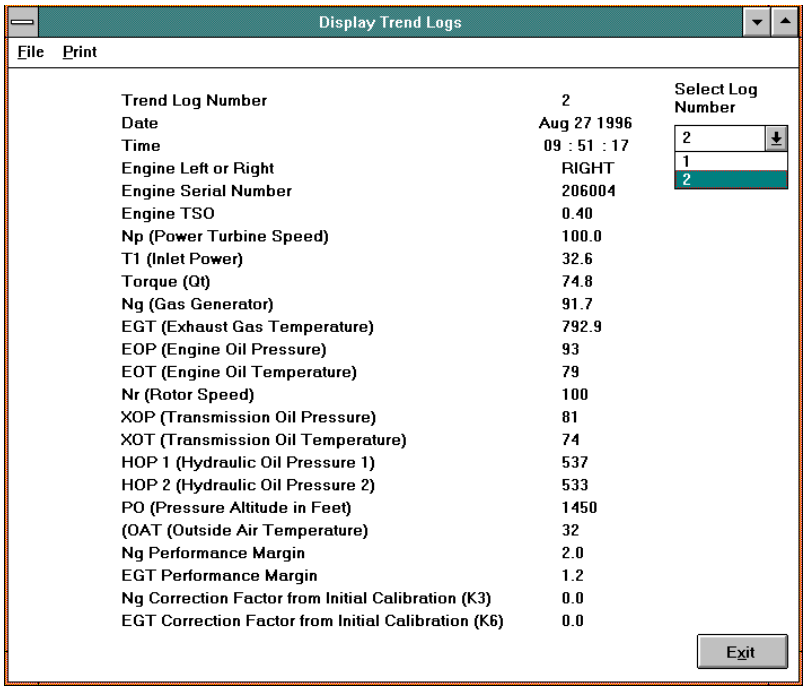
	LENG	RENG	LENG	RENG		LENG	RENG	LENG	RENG	
	Ng (%)	Ng (%)	Np (%)	Np (%)	Nr (%)	QI (%)	QI (%)	Egt (C)	Egt (C)	CLP
1	91.8	91.7	99.8	99.8	100	58.0	58.0	779	798	78
2	91.5	91.4	99.8	99.8	100	54.9	54.8	774	795	77
3	91.5	91.4	99.8	99.8	100	53.8	53.8	768	790	77
4	91.4	91.4	100.1	100.1	100	54.9	53.9	765	786	77
5	91.4	91.3	100.2	100.3	100	53.6	54.1	763	784	76
6	90.7	90.7	100.2	100.2	100	53.3	53.4	762	783	75
7	90.3	90.2	100.2	100.2	100	49.0	49.0	759	780	73
8	89.9	89.8	100.2	100.2	100	48.5	47.8	753	773	73

	LENG	RENG	LENG	RENG		LENG	RENG	LENG	RENG	
	Ng (%)	Ng (%)	Np (%)	Np (%)	Nr (%)	QI (%)	QI (%)	Egt (C)	Egt (C)	CLP
1	99.1	57.8	100.0	83.3	100	84.1	0.0	890	482	66
2	99.3	57.8	99.9	83.3	100	85.1	0.1	892	481	66
3	99.2	57.8	99.8	83.2	100	85.3	0.1	894	481	66
4	99.3	57.8	99.7	83.1	100	86.5	0.0	897	482	66
5	99.6	57.8	99.7	83.2	100	87.0	0.1	898	481	66
6	99.3	57.8	99.8	83.2	100	86.9	0.0	900	482	66
7	99.3	57.8	99.8	83.2	100	86.1	0.1	901	482	66
8	99.3	57.8	99.8	83.2	100	86.0	0.1	901	483	66

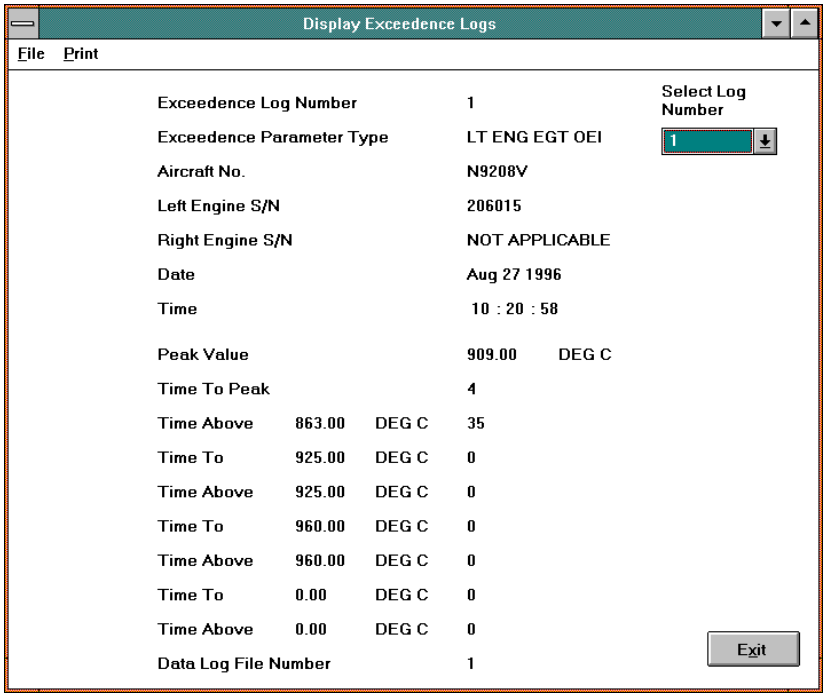
Fault Log Displays



Trend Log Displays


Display Trend Logs
File Print
Trend Log Number 2
Select Log Number
Date Aug 27 1996
Time 09 : 51 : 17
Engine Left or Right RIGHT
Engine Serial Number 206004
Engine TSO 0.40
Np (Power Turbine Speed) 100.0
T1 (Inlet Power) 32.6
Torque (Qt) 74.8
Ng (Gas Generator) 91.7
EGT (Exhaust Gas Temperature) 792.9
EOP (Engine Oil Pressure) 93
EOT (Engine Oil Temperature) 79
Nr (Rotor Speed) 100
XOP (Transmission Oil Pressure) 81
XOT (Transmission Oil Temperature) 74
HOP 1 (Hydraulic Oil Pressure 1) 537
HOP 2 (Hydraulic Oil Pressure 2) 533
PO (Pressure Altitude in Feet) 1450
(OAT (Outside Air Temperature) 32
Ng Performance Margin 2.0
EGT Performance Margin 1.2
Ng Correction Factor from Initial Calibration (K3) 0.0
EGT Correction Factor from Initial Calibration (K6) 0.0
2
1
2
Exit

Exceedance Log Displays

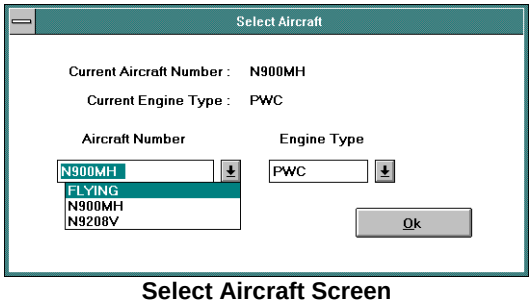


Creating Or Modifying Uploadable Setup Or Cumulative Data Files

The Menu option allows you to create a new log file or to edit an existing log file for upload to the IIDS. This function will be typically used when replacing components that have data elements in the setup or cumulative logs. When updates to the IIDS setup to cumulative log are performed for component replacements, it may be faster to perform the download procedures for the affected log and edit the appropriate component information than to create a new log.

TIP: The operator must be logged into the IIDSGP as either Full User or System Administrator to have access to this function

1. From the GBMC Main Menu, Click on the "**ASCM Menus**" control button.
2. Click on the "**Modify\Create Logs**" control button.
3. In the Select Aircraft Screen, use **TAB** key (or mouse) to select the Aircraft Number field.
4. Either type in a new aircraft number or select one by using the (↑ or ↓) arrow keys or: use mouse to select from the drop down list.
5. Click **Ok** button



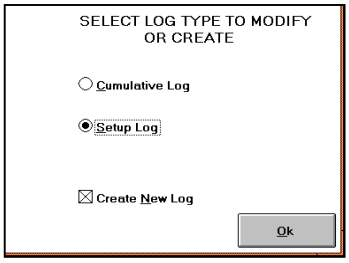
Select Aircraft Screen

Create New Setup or Cumulative Data File

TIP: In many cases it is faster and more accurate to edit an existing log than to create a new log from scratch. Existing logs can be restored from an archive for this purpose.

To create a new "Setup Data" file or "Cumulative Data" file containing default values:

1. Click the "**Create New Log**" option check box and select the log type to be generated (Cumulative or Setup).
2. Click "**Ok**" to continue.



Select Log Type Screen

3. Enter the appropriate values into the boxes next to the data field names (Ref. Editing an Existing Setup or Cumulative Data File to see the data fields).

   NOTE: Shaded boxes indicate the field is editable only by the personnel authorized as System Administrators. Both log types contain two screens of information that make up the complete log. Select the "**Sheet 2**" control button in the case of the "**Setup Log**" and the "**Right Engine**" control button in the case of the "**Cumulative Log**" to get to the second page.

To select a parameter to enter either select with mouse or use the **TAB** or **SHIFT+TAB** keys to cycle through the field until reaching the desired field. When all data entry has been completed click on the "**Exit**" control button. If any field has been changed, the operator will be given the option to either save the file as "***.up**" (Ok), discard file (No), or cancel and return to editing file. If no data has been entered, then a dialog box will prompt you that the file will not be saved.

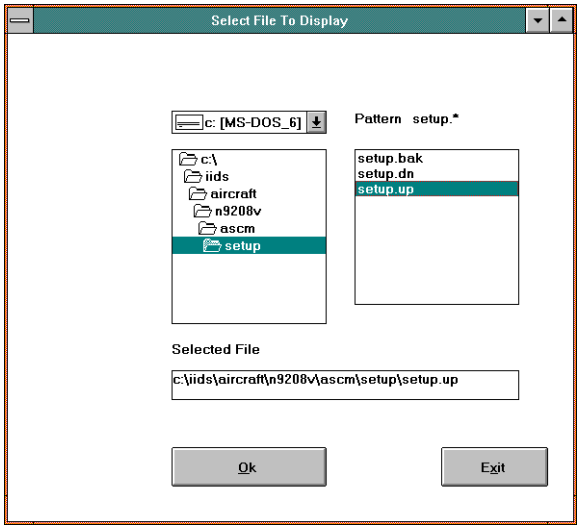
Editing an Existing Setup or Cumulative Data File

To modify an existing "**Setup Data"** file (either setup.dn, setup.up or setup.bak) or "**Cumulative Data"** file (cum.dn, cum.up or cum.bak):

NOTE: Only the file types with the ".dn", ".up", or ".bak" extensions can be used for editing purposes.

EXAMPLE: To create an upload file for the Setup Data Log, select a file from the file list in the "Select File To Display" screen titled "setup.dn", "setup.up" or "setup.bak"

1. Select the log type (**Cumulative** or **Setup**) and **DO NOT** click the "**Create New Log**" option check box.
2. Click "**Ok**" to continue.
3. Select the log to be modified by clicking on the log name.



Select File To Display Screen

4. The Select File To Display Screen will become visible.

5. Select the desired file with the mouse or:
    a. Use **TAB** key to select the rectangle displaying possible files.
    b. Use (↑ or ↓) arrow keys to select the desired file to edit.
6. Click on the "**Ok**" control button to begin editing.

A display screen will appear containing the current data for each parameter. Any parameter that has a box surrounding the data field, that is ***not shaded,*** maybe edited or new values inserted. Shaded boxes are only available for editing at the System Administrator security level.

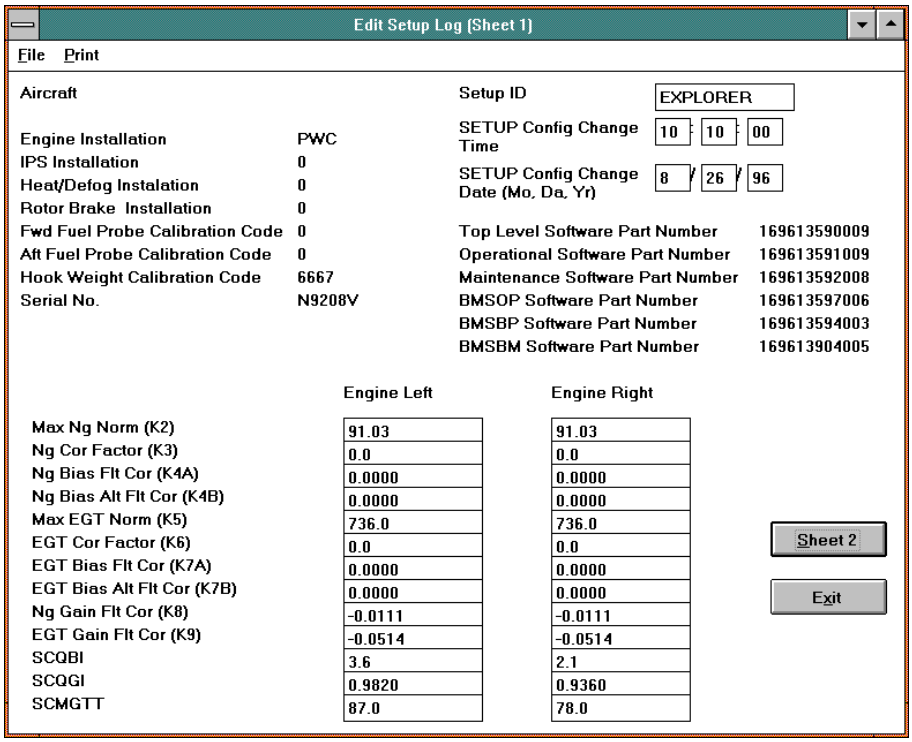
NOTE: Both log types contain two screens of information that make up the complete log. Select the "**Sheet 2**" control button in the case of the "**Setup Log**" and the "**Right Engine**" control button in the case of the "**Cumulative Log**" to get to the second page.

To select a parameter to edit either select with mouse or use the **TAB** or **SHIFT+TAB** keys to cycle through the field until reaching the desired field. When all editing has been completed click on the "**Exit**" control button.

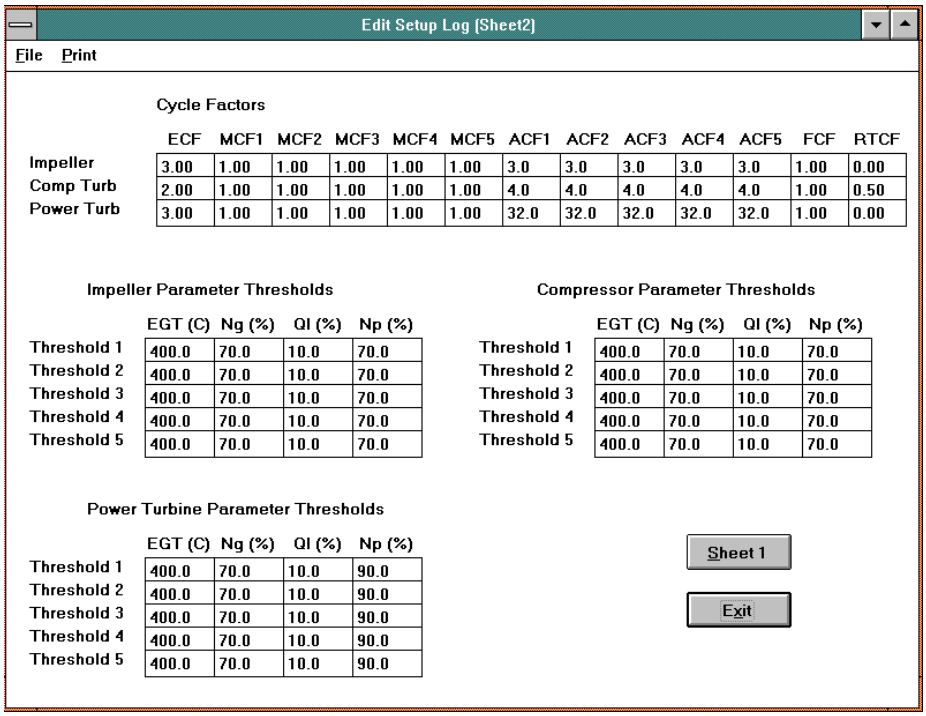
If the field has been changed, the operator will be given the option to either save the file as "***.up**" (Ok), discard file (No), or cancel and return to editing file. If there has been no changes, then a dialog box will prompt you that the file will not be saved.

NOTE: The two editable logs are the Setup and Cumulative logs.

Setup Log Screens

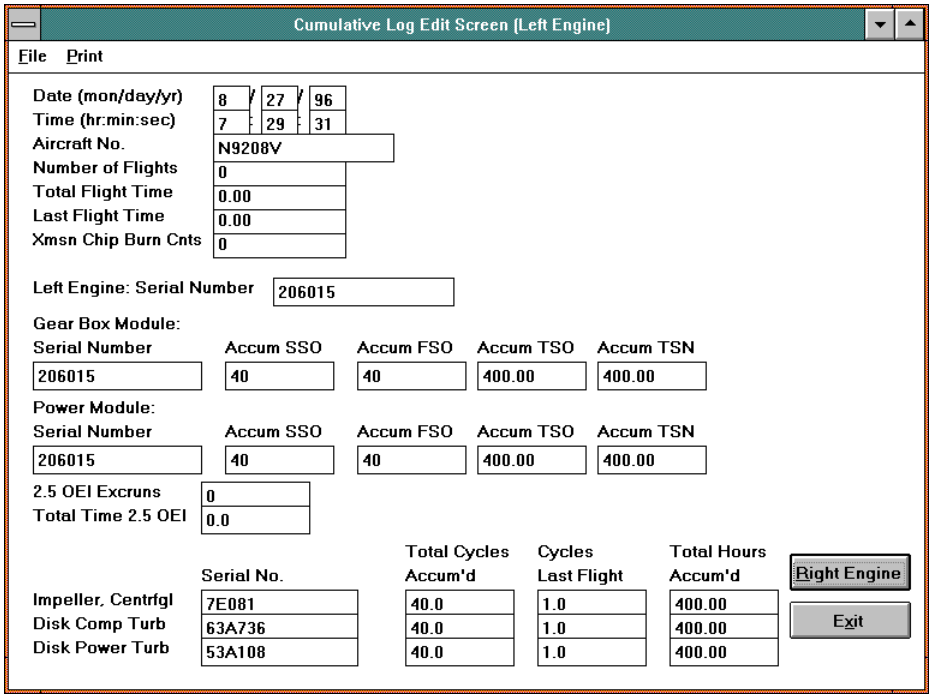

Edit Setup Log (Sheet 1)
File Print
Aircraft
Setup ID
EXPLORER
Engine Installation PWC
IPS Installation 0
Heat/Defog Instalation 0
Rotor Brake Installation 0
Fwd Fuel Probe Calibration Code 0
Aft Fuel Probe Calibration Code 0
Hook Weight Calibration Code 6667
Serial No. N9208V
SETUP Config Change Time 10 : 10 : 00
SETUP Config Change Date (Mo, Da, Yr) 8 / 26 / 96
Top Level Software Part Number 169613590009
Operational Software Part Number 169613591009
Maintenance Software Part Number 169613592008
BMSOP Software Part Number 169613597006
BMSBP Software Part Number 169613594003
BMSBM Software Part Number 169613904005
Engine Left
Engine Right
Max Ng Norm (K2) 91.03 91.03
Ng Cor Factor (K3) 0.0 0.0
Ng Bias Flt Cor (K4A) 0.0000 0.0000
Ng Bias Alt Flt Cor (K4B) 0.0000 0.0000
Max EGT Norm (K5) 736.0 736.0
EGT Cor Factor (K6) 0.0 0.0
EGT Bias Flt Cor (K7A) 0.0000 0.0000
EGT Bias Alt Flt Cor (K7B) 0.0000 0.0000
Ng Gain Flt Cor (K8) -0.0111 -0.0111
EGT Gain Flt Cor (K9) -0.0514 -0.0514
SCQBI 3.6 2.1
SCQGI 0.9820 0.9360
SCMGTT 87.0 78.0
Sheet 2
Exit

Edit Setup Log (Sheet 1) Screen

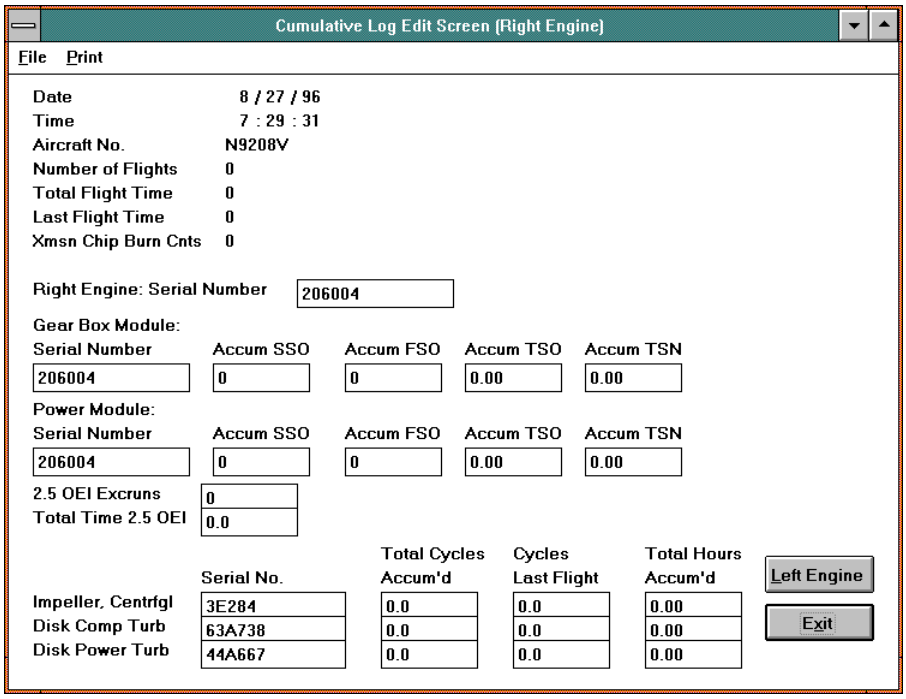

Edit Setup Log (Sheet2)
File Print
Cycle Factors
ECF MCF1 MCF2 MCF3 MCF4 MCF5 ACF1 ACF2 ACF3 ACF4 ACF5 FCF RTCF
Impeller 3.00 1.00 1.00 1.00 1.00 1.00 3.0 3.0 3.0 3.0 3.0 1.00 0.00
Comp Turb 2.00 1.00 1.00 1.00 1.00 1.00 4.0 4.0 4.0 4.0 4.0 1.00 0.50
Power Turb 3.00 1.00 1.00 1.00 1.00 1.00 32.0 32.0 32.0 32.0 32.0 1.00 0.00
Impeller Parameter Thresholds
EGT (C) Ng (%) Ql (%) Np (%)
Threshold 1 400.0 70.0 10.0 70.0
Threshold 2 400.0 70.0 10.0 70.0
Threshold 3 400.0 70.0 10.0 70.0
Threshold 4 400.0 70.0 10.0 70.0
Threshold 5 400.0 70.0 10.0 70.0
Compressor Parameter Thresholds
EGT (C) Ng (%) Ql (%) Np (%)
Threshold 1 400.0 70.0 10.0 70.0
Threshold 2 400.0 70.0 10.0 70.0
Threshold 3 400.0 70.0 10.0 70.0
Threshold 4 400.0 70.0 10.0 70.0
Threshold 5 400.0 70.0 10.0 70.0
Power Turbine Parameter Thresholds
EGT (C) Ng (%) Ql (%) Np (%)
Threshold 1 400.0 70.0 10.0 90.0
Threshold 2 400.0 70.0 10.0 90.0
Threshold 3 400.0 70.0 10.0 90.0
Threshold 4 400.0 70.0 10.0 90.0
Threshold 5 400.0 70.0 10.0 90.0
Sheet 1
Exit

Edit Setup Log (Sheet 2) Screen

Cumulative Logs


Cumulative Log Edit Screen (Left Engine)
File Print
Date (mon/day/yr) 8 / 27 / 96
Time (hr:min:sec) 7 : 29 : 31
Aircraft No. N9208V
Number of Flights 0
Total Flight Time 0.00
Last Flight Time 0.00
Xmsn Chip Burn Cnts 0
Left Engine: Serial Number 206015
Gear Box Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206015 40 40 400.00 400.00
Power Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206015 40 40 400.00 400.00
2.5 OEI Excruns 0
Total Time 2.5 OEI 0.0
Serial No. Total Cycles Accum'd Cycles Last Flight Total Hours Accum'd
Impeller, Centrfgl 7E081 40.0 1.0 400.00
Disk Comp Turb 63A736 40.0 1.0 400.00
Disk Power Turb 53A108 40.0 1.0 400.00
Right Engine
Exit

Cumulative Log (Left Engine)


Cumulative Log Edit Screen (Right Engine)
File Print
Date 8 / 27 / 96
Time 7 : 29 : 31
Aircraft No. N9208V
Number of Flights 0
Total Flight Time 0
Last Flight Time 0
Xmsn Chip Burn Cnts 0
Right Engine: Serial Number 206004
Gear Box Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206004 0 0 0.00 0.00
Power Module:
Serial Number Accum SSO Accum FSO Accum TSO Accum TSN
206004 0 0 0.00 0.00
2.5 OEI Excruns 0
Total Time 2.5 OEI 0.0
Serial No. Total Cycles Accum'd Cycles Last Flight Total Hours Accum'd
Impeller, Centrfgl 3E284 0.0 0.0 0.00
Disk Comp Turb 63A738 0.0 0.0 0.00
Disk Power Turb 44A667 0.0 0.0 0.00
Left Engine
Exit

Cumulative Log (Right Engine)

Printing Log Files

The Menu option allows you to print log files. You may select individual logs or select the Print All Logs option box to print all the logs for a specific aircraft.

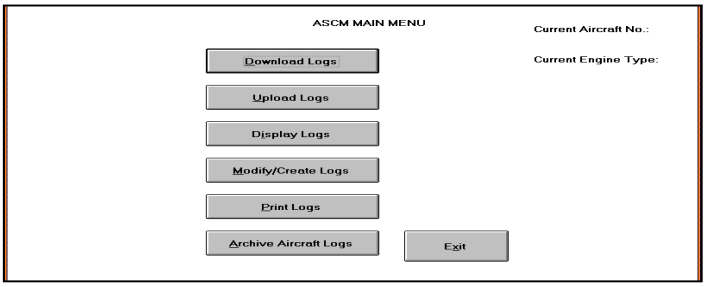
TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

All logs are printed using the windows printer drivers. The drive for your printer MUST be selected in the Print Driver Section of the Windows Control Panel. Refer to the Window's 3.1 manual for instructions on configuring a printer.

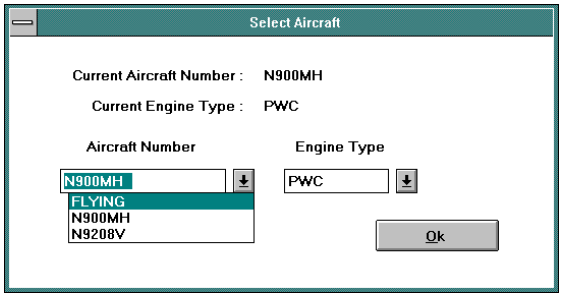
Log files can be printed individually while displaying a log from the Display Logs Menu (refer to previous section), or all the logs of a given type may be printed by selecting the Print Menu.

To use the Print Menu follow:

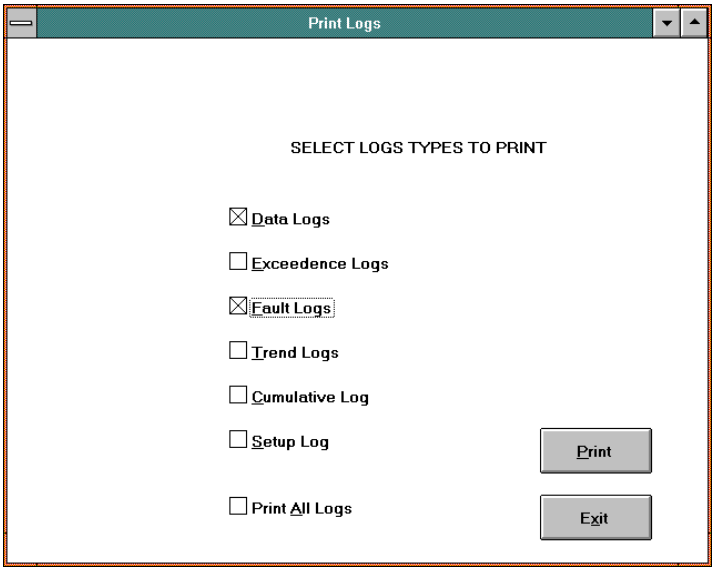
1. Click on the "**ASCM Menus**" control button.
2. Click on the "**Print Logs**" control button.



3. In the Select Aircraft Screen, use **TAB** key (or mouse) to select the Aircraft Number field.
   a. Type in a new aircraft number or;
   b. Select one by using the (↑ ↓) arrow keys (or use mouse to select from the drop down list).



4. In the Select the Log Type To Print screen, select the log type to print **Data**, **Exceedance, Fault, Trend, Cumulative, Setup** or **Print All Logs,** and click the "**Ok**" control button to continue.



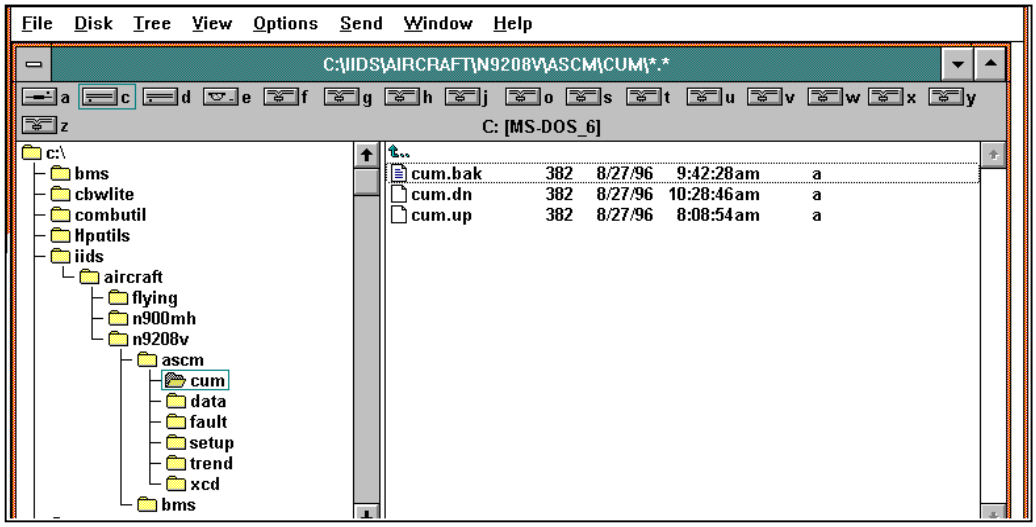
5. Selecting a log type will print out all logs of that given type. Selecting All Logs will print all logs of all types.

   NOTE: The Exceedance, Fault and Trend Logs may contain as many as 100 individual log entries each. The Data log may contain up to five (5) entries.

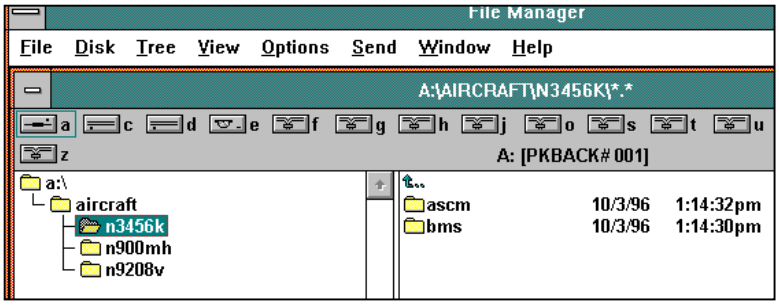
6. A message will be displayed indicating the status of the print job.

Archive/Restore Log Files

This menu option allows you to archive downloaded aircraft records for historical purposes. The archives are a snapshot of the existing aircraft subdirectories and the log files contain in the aircraft's folder under "C:\iids\aircraft\" as pictured in the figure below.



Each "aircraft" folder contains several folders in which different types of log files are stored. When you "archive" files for a particular aircraft, the complete set of folders (the aircraft's folder and all sub folders and files are copied to the "target" archive disk. If a top level folder named "AIRCRAFT" does not exist on the target disk, it will be created and the individual aircraft folders and sub folders/files will be placed under this folder. If different aircraft are archived to the same target disk, each aircraft will have a folder under the "AIRCRAFT" top level folder.



Floppy Disk Historical Archives

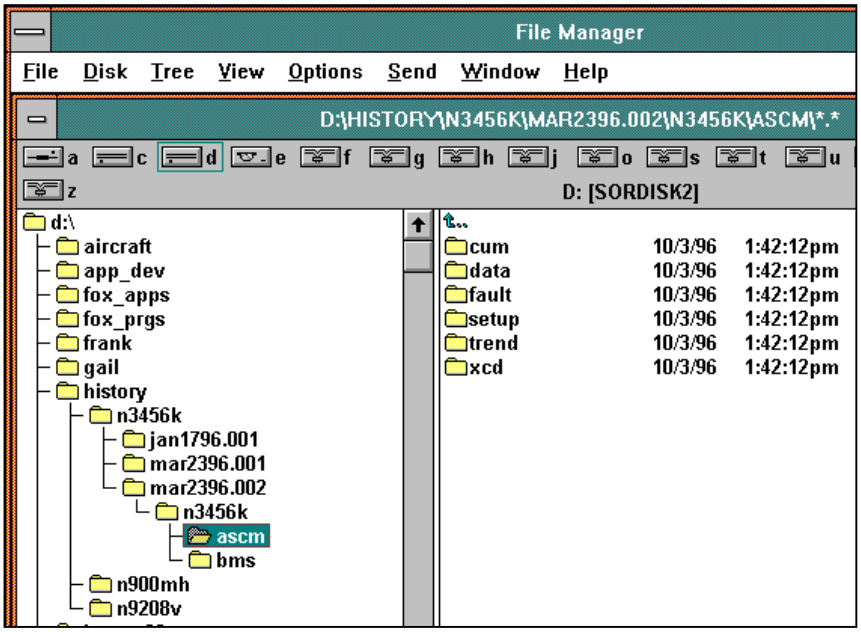
Each time an aircraft is archived, the contents of the aircrafts directories and files on the "target" disk are replaced. To maintain a historical archive on floppy disks, it will be necessary to use a new disk each time an aircraft archive is created. This will prevent the loss of historical data.

Hard Disk Historical Archives

Saving historical data on a hard disk will require you to create your own directory structure into which the archived records can be stored. It you create a directory structure as pictured below, you can create a folder for each instance of an aircraft's archive. Labeling subfolders in this archive by date/instance will allow you to locate historical data more quickly.

The method pictured here uses the following code to establish subdirectory names;

- The first three digits of the directory name represent the month.
- The fourth and fifth digits represent the day of the month.
- The sixth and seventh digits represent the year.
- Add an extension (".001, .002, etc.") sequentially, to identify each instance.



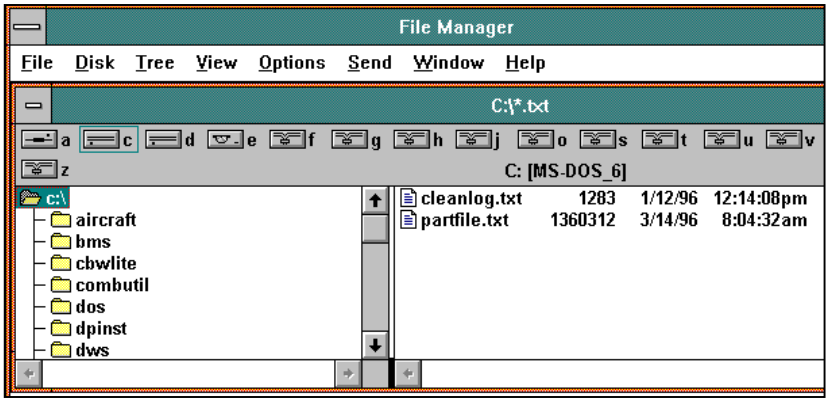
NOTE: The archive function allows you to select the ***target disk to archive to only!***. This will create the "AIRCRAFT" folder in the root directory of this disk. Each time the archive is performed, the contents of the "AIRCRAFT" folder in this root directory will be replaced with the new archive files.

After creating the "HISTORY" directory structure, move the aircraft's folder from the "AIRCRAFT" folder in the root directory to the historical folder you just created for this archive instance.

NOTE: For the Restore archive function to work, the historical files must be copied back to the "AIRCRAFT" root directory.

Generating ASCII Files

This function allows you to generate ASCII files of a specific aircraft's logs. These files can then be utilized in other programs for analysis or documentation. For example, data in the Cumulative log could be imported into a spreadsheet or database application to produce reports or graphs on flight times vs engine cycle counts to help project cost based on mission profiles. Engine/airframe usage data could be collected and used to produce maintenance projection reports based on usage information such as cycle counting. Other uses might be to produce computer generated logbooks. This function is provided to allow owners/operators to easily incorporate the collected data into their own systems.

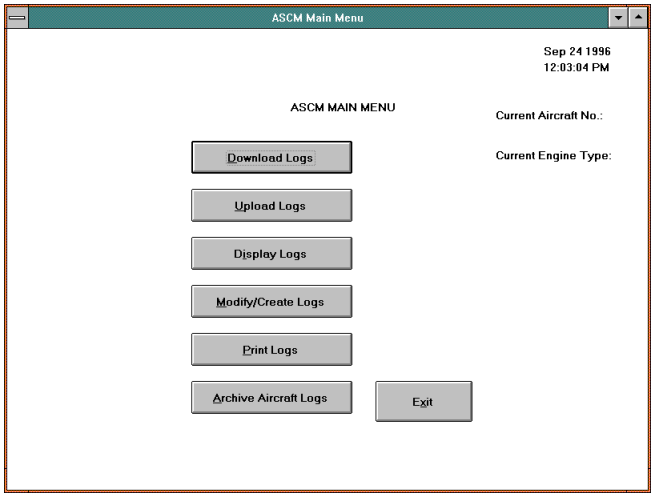


NOTE: The generated ASCII files will be written to the target disk in the root directory of the disk. ***The generated ASCII files, for the selected aircraft will replace those presently on the disk.***

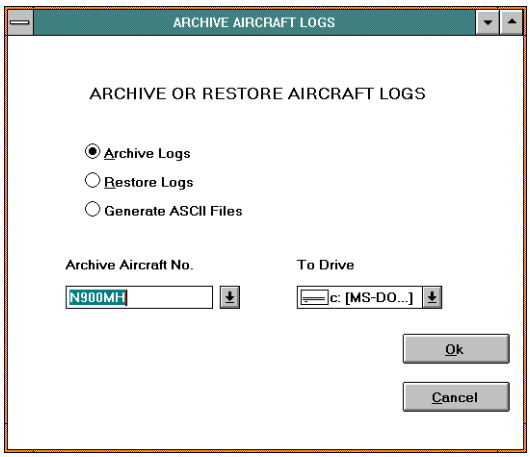
To Archive Files:

TIP: The operator must be logged into the IIDSGP as either Full User or System Administrator to have access to this function.

1. Click on the "**ASCM Menus**" control button.
2. Click on the "**Archive Aircraft Logs**" control button.



3. In the Archive Or Restore Aircraft Logs Screen select to "**Archive**".



4. Using the **TAB** key (or mouse) select the Drive field. Use the (↑ ↓) arrow keys to select drive to either store data or retrieve data.

   NOTE: The archive function allows you to select the ***target disk to archive to only!***. This will create the "AIRCRAFT" folder in the root directory of this disk. Each time the archive is performed, the contents of the "AIRCRAFT" folder in this root directory will be replaced with the new archive files.

5. Using the **TAB** key (or mouse) select the Aircraft No. field. Use the (↑ ↓) arrow keys to select the aircraft number to archive.

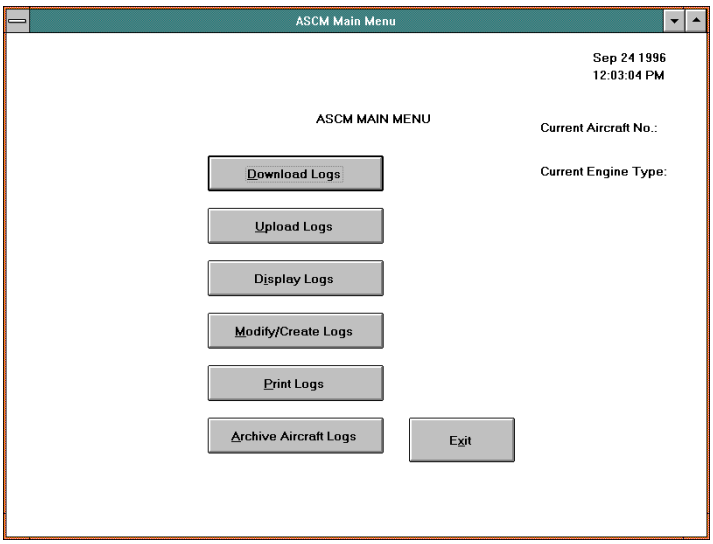
6. Click "**Ok**"

To Restore Files:

TIP: The operator must be logged into the IIDSGP as either Full User or System Administrator to have access to this function.

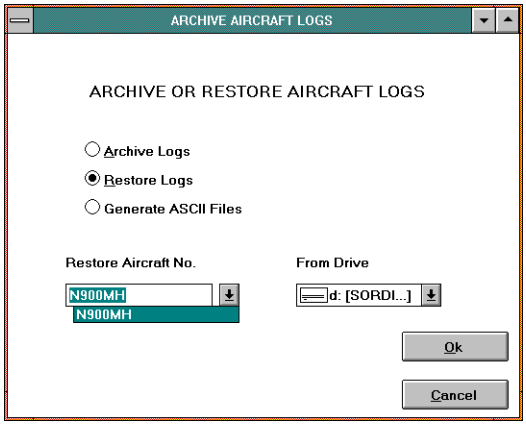
1. Click on the "**ASCM Menus**" control button.

2. Click on the "**Archive Aircraft Logs**" control button.

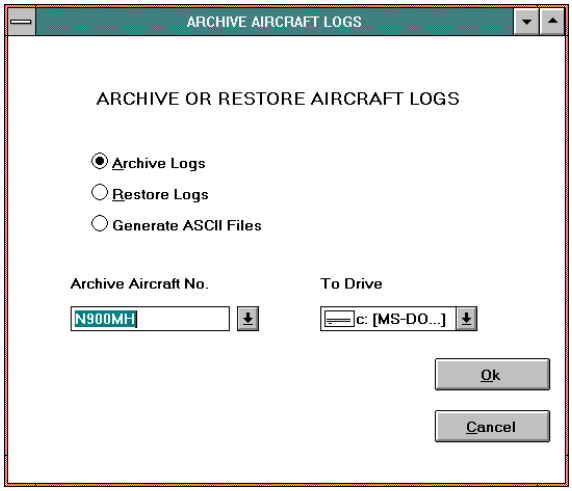


TIP: Be sure the log files presently on the GBMC hard drive, for the aircraft being restored, are archived first. They will be overwritten by the restore process.

3. In the Archive Or Restore Aircraft Logs Screen select "**Restore**".



4. Using the **TAB** key (or mouse) select the Drive field. Use the (↑ ↓) arrow keys to select drive to retrieve archive data from.



NOTE: The archive function allows you to select the ***target disk to restore archives from only!***. If you are restoring files from a historical archive (on a hard disk) as described above, you must copy the required archive folder back into the "AIRCRAFT" root directory in order to make it accessible to the restore function. The restored aircraft's files will replace those presently on the GBMC's hard disk. ***If the files (logs for the selected aircraft) presently on the GBMC hard disk have not yet been archived they will be lost!***

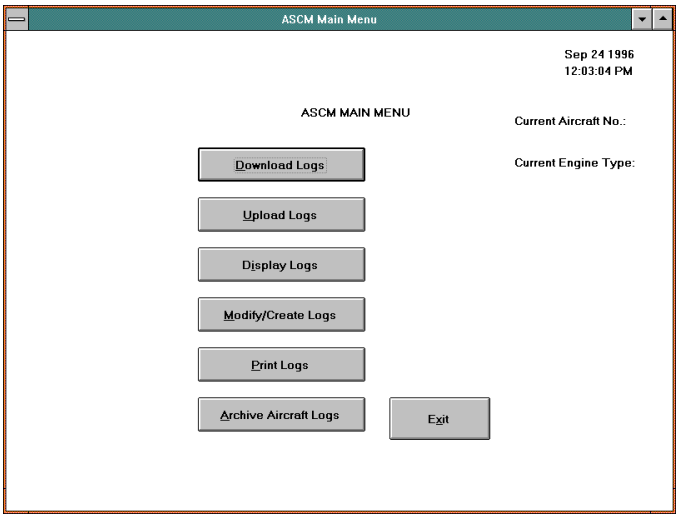
5. Using the **TAB** key (or mouse) select the Aircraft No. field. Use the (↑ ↓) arrow keys to select the aircraft number to restore.

6. Click "**Ok**"

Generate ASCII Files:

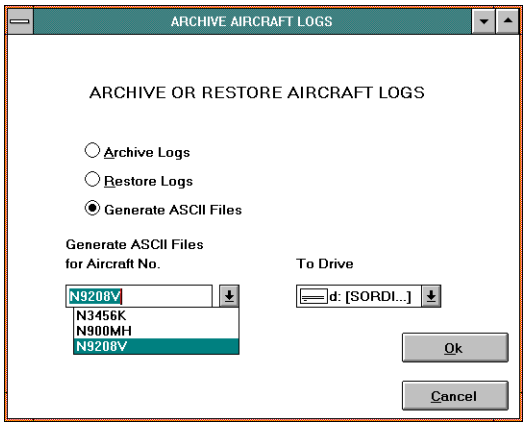
TIP: The operator must be logged into the IIDSGP as either Full User or System Administrator to have access to this function.

1. Click on the "**ASCM Menus**" control button.
2. Click on the "**Archive Aircraft Logs**" control button.



TIP: Be sure the log files presently on the GBMC hard drive, for the aircraft being restored, are archived first. They will be overwritten by the restore process.

3. In the Archive Or Restore Aircraft Logs Screen select "**Generate ASCII Files**".



NOTE: The "**Generate ASCII Files**" function allows you to select the target disk to write the ACSII files to. The generated ASCII files will be written to the target disk root directory. ***The generated ASCII files, for the selected aircraft will replace those presently on the disk.***

4. Using the **TAB** key (or mouse) select the Drive field. Use the (↑ ↓) arrow keys to select drive to write ASCII data files to.
5. Using the **TAB** key (or mouse) select the Aircraft No. field. Use the (↑ ↓) arrow keys to select the aircraft number to identify the files to convert to ASCII.
6. Click "**Ok**"

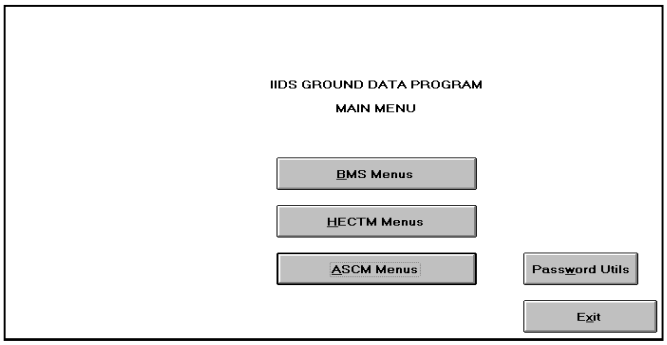
ECTM Menu

Ref. Pratt & Whitney user guide and reference manual for the Helicopter Engine Condition and Trend Monitor (HECTM™) program (Version 1.00) for instructions.

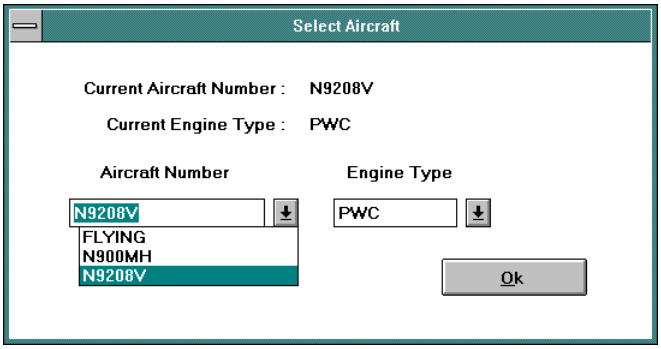
This Menu option generates an HECTM™ standard file format for a selected aircraft from the downloaded Trend Log file. The program will then launch the HECTM™ application using the standard file that was just generated.

TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

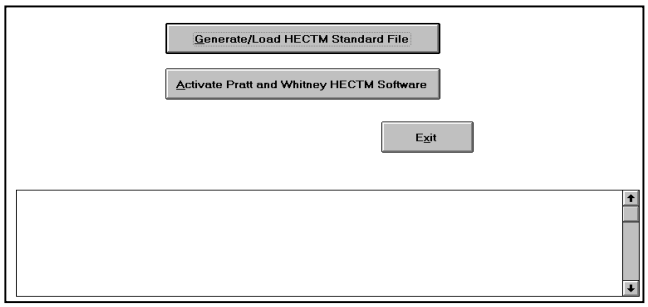
1. Select **HECTM Menu** from the GBMC Main Menu.



2. In the Select Aircraft Screen, use **TAB** key (or mouse) to select the Aircraft Number field.
   a. Type in an aircraft number or;
   b. Select one by using the (↑ ↓) arrow keys (or use mouse to select from the drop down list).

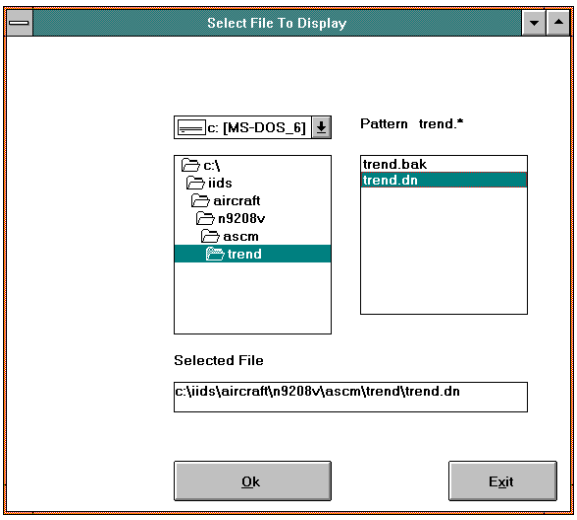


3. Press **OK**. The HECTM™ Menu screen will appear.



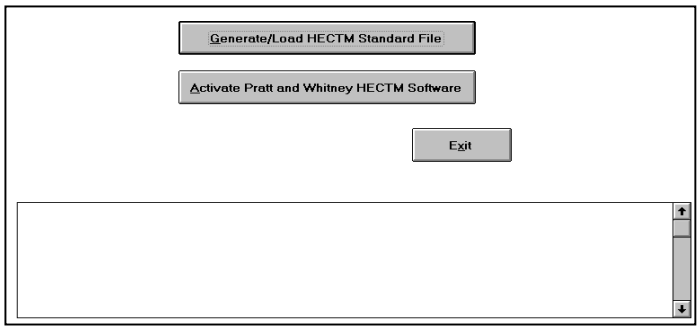
4. Select the **Generate/Load HECTM Standard File** button.

5. The GBMC program will automatically select the aircraft Trend Log directory based on the aircraft you selected. Select the trend log file you wish to use (typically "<log file>.dn") and press **OK**.

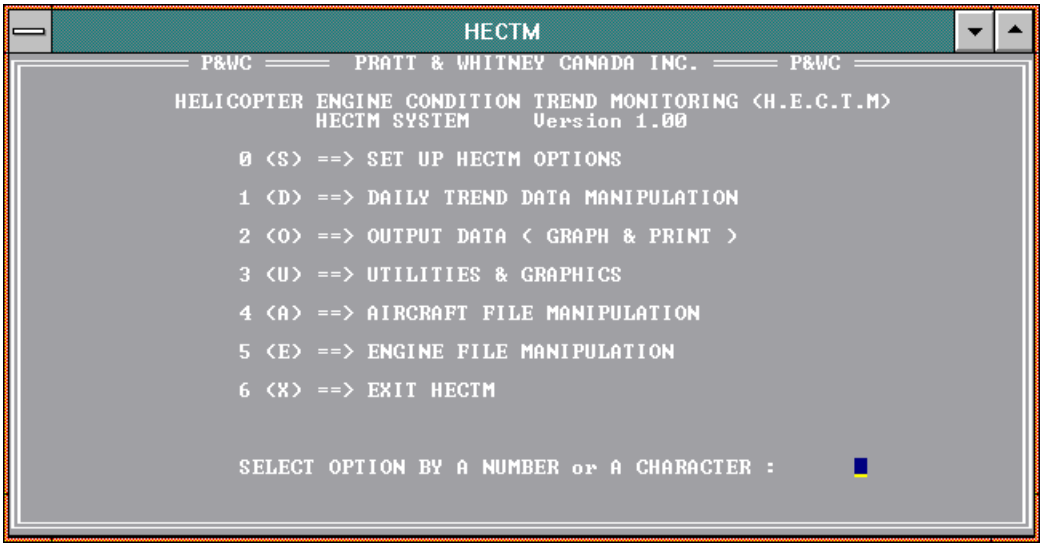


6. The GBMC program will generate a standard file format compatible with the Pratt & Whitney HECTM™ application. A dialog box will be displayed indicating the standard file has been created.

7. Press **OK**. The HECTM™ Menu screen will reappear.



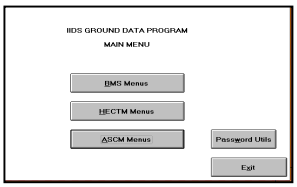
8. Select **Activate Pratt and Whitney HECTM Software** button. The HECTM™ application will be launched. Refer to the HECTM™ user manual for further instructions.


HECTM
P&WC
PRATT & WHITNEY CANADA INC.
P&WC
HELICOPTER ENGINE CONDITION TREND MONITORING (H.E.C.T.M)
HECTM SYSTEM Version 1.00
0 (S) ==> SET UP HECTM OPTIONS
1 (D) ==> DAILY TREND DATA MANIPULATION
2 (O) ==> OUTPUT DATA (GRAPH & PRINT)
3 (U) ==> UTILITIES & GRAPHICS
4 (A) ==> AIRCRAFT FILE MANIPULATION
5 (E) ==> ENGINE FILE MANIPULATION
6 (X) ==> EXIT HECTM
SELECT OPTION BY A NUMBER or A CHARACTER :

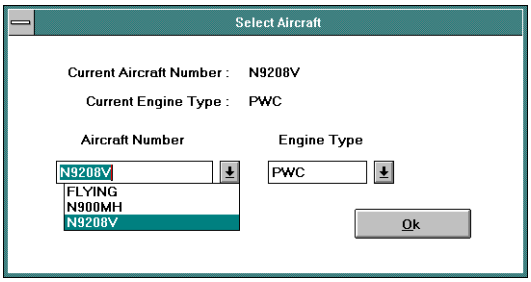
Balance Monitor System (BMS) Menu

The Chadwick-Helmuth BMS Transfer program is a DOS based program. Selecting this option will change the display mode of your computer to "character mode". This program is used to **Download Logs from BMS, Clear BMS Logs, Run VibraLog for Windows**, and **Upload to BMS**.

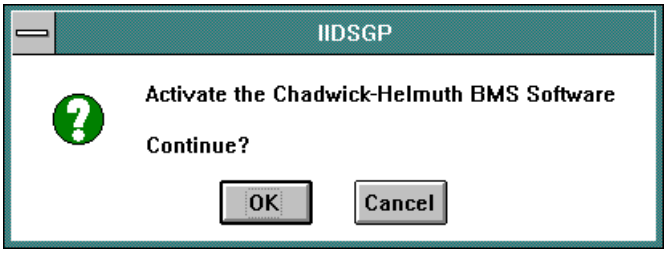
1. To start the BMS Program, select BMS Menu from the GBMC main menu screen.



2. Select the helicopter to use for this BMS session.



3. The following dialog box will appear. Select **OK** to launch the BMS program.



NOTE: The screen will now switch to character mode for the BMS program and the BMS menu will appear. This screen is shown as it appears when the user is logged on as System Administrator. Menu item "**4. Upload to BMS**", Is only available at the System Administrator level. If you are logged on as either a Full User or Limited User, this menu item will not appear.

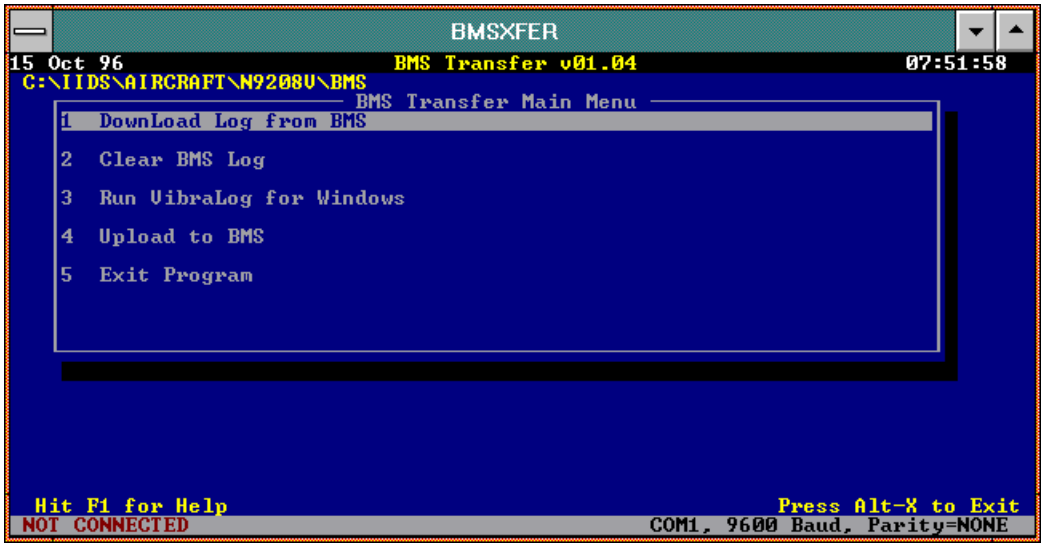
Downloading BMS Logs

This menu option allows you to download BMS logs. These logs are the BMS Fault Log, Spectrum Log, Main Rotor Balance Log, NOTAR Balance Log, and the Advisory Log. Refer to the Introduction paragraphs for a description of these logs.

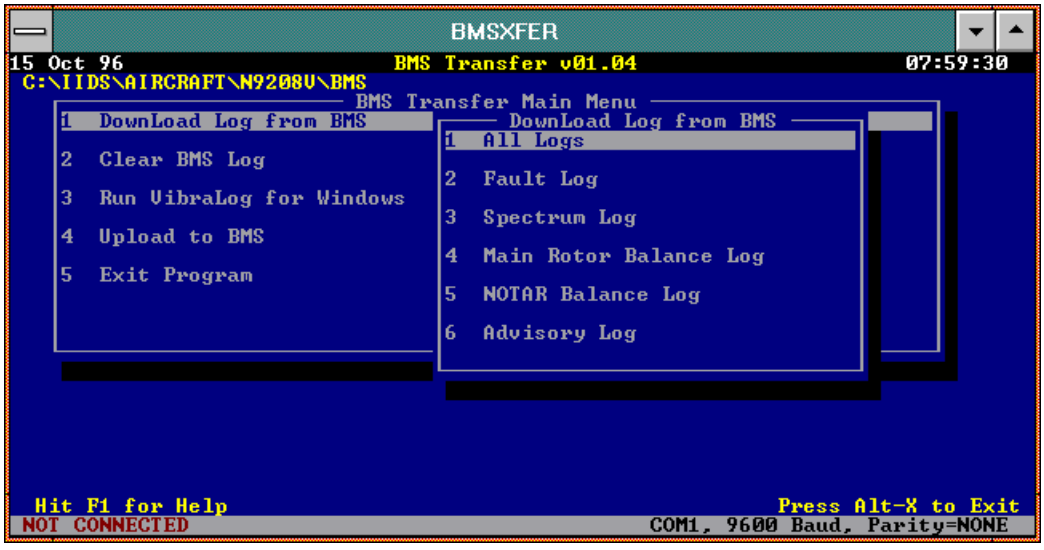
TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

This procedure is for downloading individual logs or all logs from the BMS system.

1. Connect the GBMC to the IIDS (Ref. Connecting the GBMC Computer To The IIDS).
2. Select **DownLoad Log from BMS** option bar using the (↑ ↓) arrow keys and press the **ENTER** key or, press the number "**1**" and press **ENTER**.



3. Select log to download using the (↑ ↓) arrow keys, or press the menu option number (**1, 2, 3,** etc.), and press the **ENTER** key.



4. A status screen will appear indicating the download progress of each log being transferred. Verify that "**OK**" appear after each log file name when "**Download Complete**" flashes at the bottom of the screen.

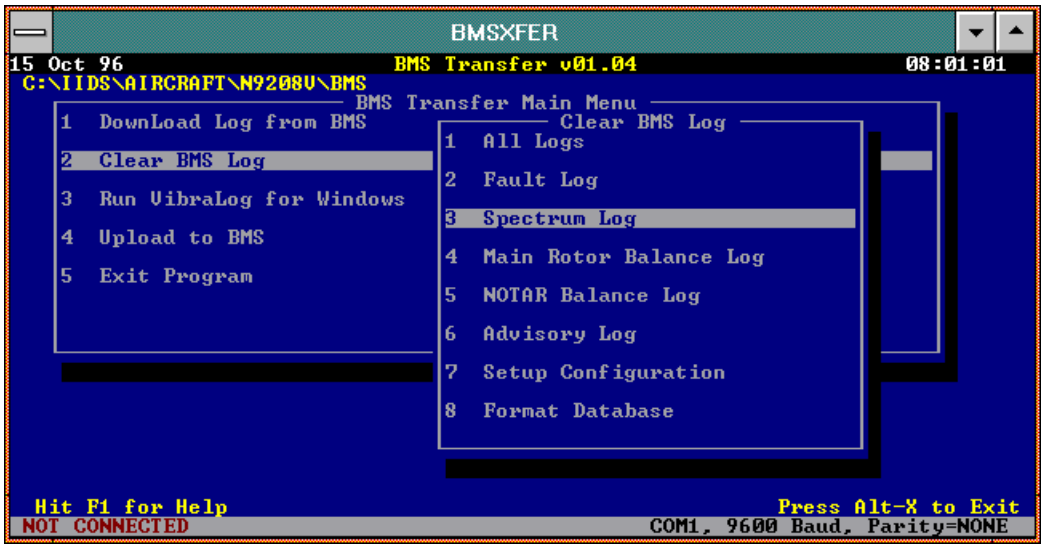
5. Press the Escape key (**Esc**) twice to return to the main BMS menu.
6. Disconnect the GBMC from the IIDS.

Clearing BMS Logs

TIP: The operator must be logged into the IIDSGP as either Limited User, Full User or System Administrator to have access to this function.

This procedure is for clearing individual logs or all logs from the BMS system (memory in IIDS).

1. Connect the GBMC to the IIDS (Ref. Connecting the GBMC Computer To The IIDS).
2. Select **Clear BMS Log** option bar using the (↑ ↓) arrow keys and press the **ENTER** key or pressing the number "**2**" and press **ENTER**.
3. Select log to clear using the (↑ ↓) arrow keys, or press the menu option number (**1, 2, 3,** etc.), and press the **ENTER** key.



4. A dialog box will indicate the log clearing status. When complete, the message "**DATA XFER CMPL**" is displayed on the IIDS alpha-numeric display, the logs have been cleared.
5. Pressing the **CLR** button on the IIDS will Clear the message from the alpha-numeric display.
6. Disconnect the GBMC from the IIDS.

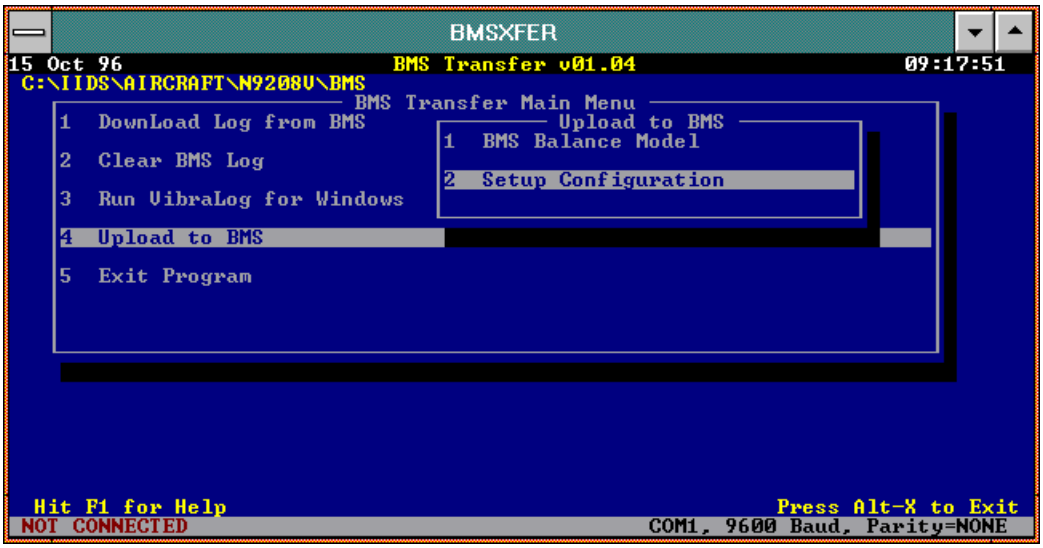
Uploading BMS Model OR Setup Configuration

This menu option is used to upload the balance model used to perform Main Rotor and NOTAR Fan balance calculation or the BMS Setup configuration file. **This option is restricted to MDHI authorized personnel only and requires a special *System Administrator* password to complete the operation.** Contact your MDHI Field Service Representative for assistance in performing this function.

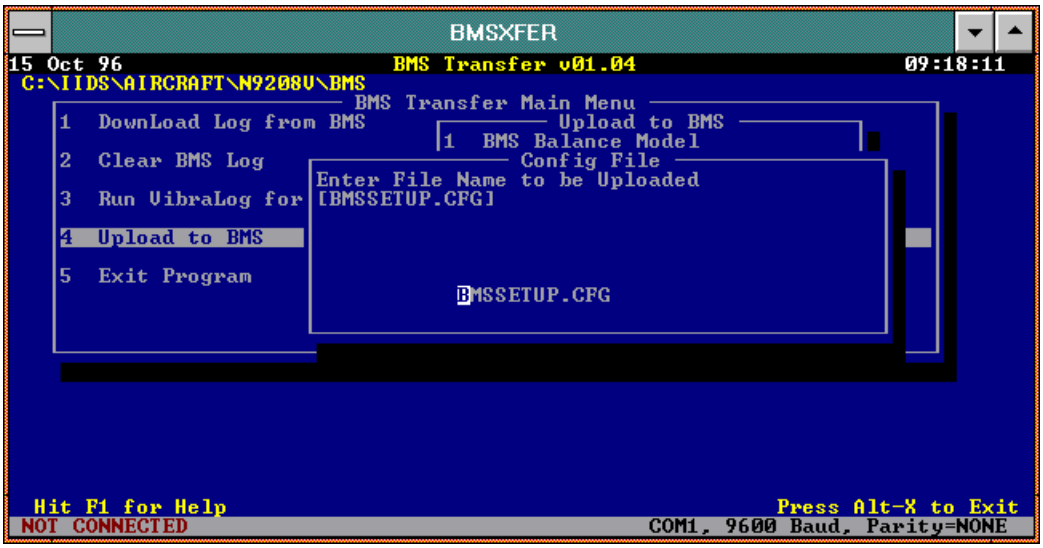
TIP: The operator must be logged into the IIDSGP as System Administrator to have access to this function.

This procedure applies to uploading either a BMS balance model or new/changed BMS configuration data.

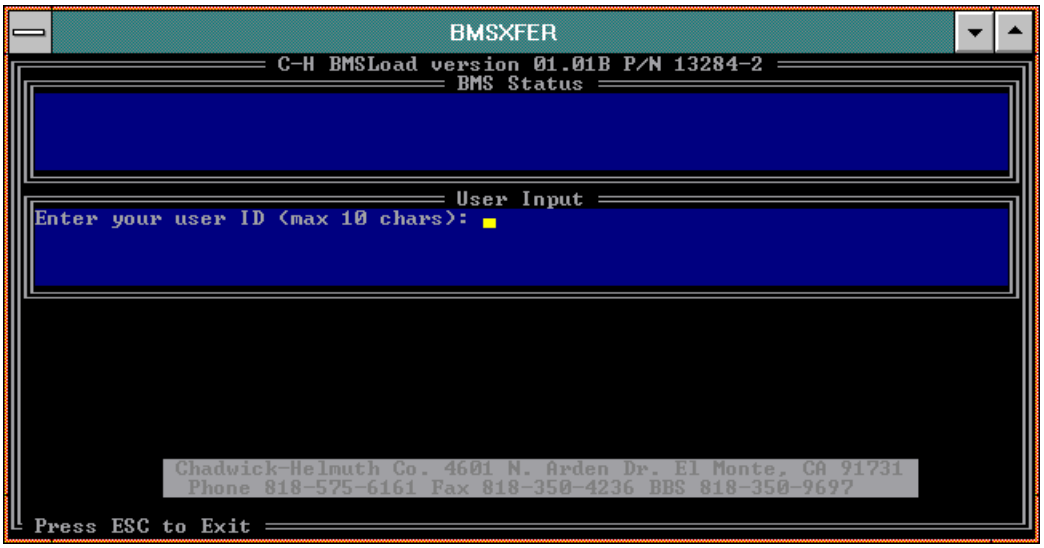
1. Connect the GBMC to the IIDS (Ref. Connecting the GBMC Computer To The IIDS).
2. Select **Upload to BMS** option bar using the (↑ ↓) arrow keys and press the **ENTER** key or; pressing the number "**4**" and press **ENTER**.
3. Select **BMS Balance Model** or **Setup Configuration** to upload using the (↑ ↓) arrow keys, or press the menu option number (**1, 2, 3,** etc.), and press the **ENTER** key.



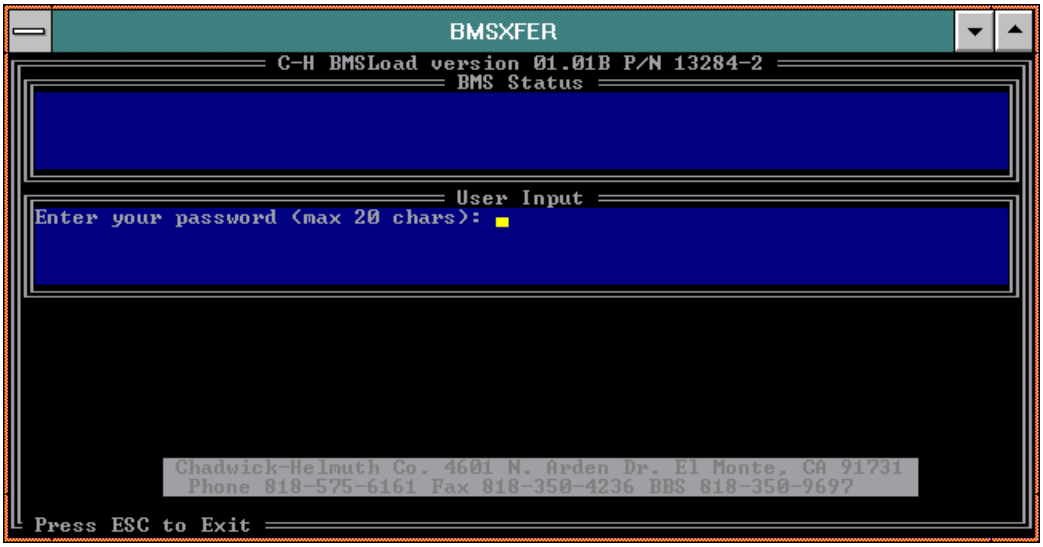
4. If you are uploading a Setup Configuration file, the following screen will appear and prompt you to enter the name of the file to upload. This defaults to "BMSSETUP.CFG". Press **ENTER** to confirm.



5. A dialog box will display a message "**Overwrite Existing File?**". Press **ENTER** to confirm.
6. The BMS Upload Status screen will appear and ask you to enter your ID. Enter your ID and press **ENTER**.

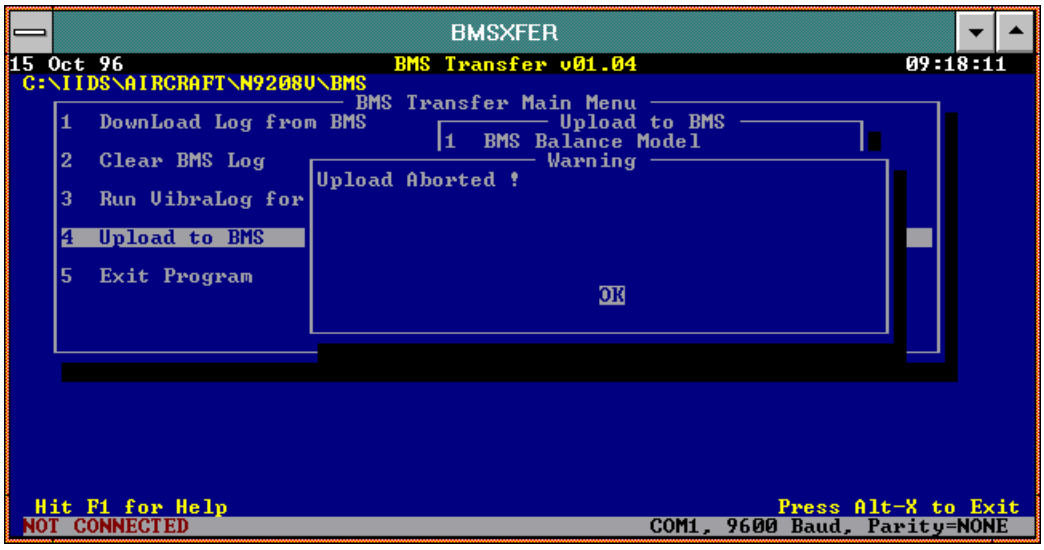

BMSXFER
C-H BMSLoad version 01.01B P/N 13284-2
BMS Status
User Input
Enter your user ID (max 10 chars):
Chadwick-Helmuth Co. 4601 N. Arden Dr. El Monte, CA 91731
Phone 818-575-6161 Fax 818-350-4236 BBS 818-350-9697
Press ESC to Exit

7. You will then be prompted to enter your password. Enter your password and press **ENTER**.


BMSXFER
C-H BMSLoad version 01.01B P/N 13284-2
BMS Status
User Input
Enter your password (max 20 chars):
Chadwick-Helmuth Co. 4601 N. Arden Dr. El Monte, CA 91731
Phone 818-575-6161 Fax 818-350-4236 BBS 818-350-9697
Press ESC to Exit

The BMS Status portion of the screen will display the upload progress.

8. At the "**Upload Done OK**" prompt, press **ENTER** then **ESC.** A Warning message will appear stating "**Upload Aborted OK**". This is normal. Press **ESC** to return to the main menu.



9. Verify that the message "**DATA XFER CMPL**" is displayed on the IIDS alpha-numeric display. Pressing the **CLR** button on the IIDS will clear the message from the alpha-numeric display.
10. Disconnect the GBMC from the IIDS.

APPENDIX

ASCM Log Definition Tables

Setup Log

	PARAMETER	RANGE OF VALUES
Aircraft:		
3	Engine Installation	PWC or TEC
3	IPS Installation	Installed or not installed
3	Heat/Defog Installation	Installed or not installed
3	Rotor Brake Installation	Installed or not installed
3	Fwd Fuel Probe Calibration Code	3 Alphanumeric characters
3	Aft Fuel Probe Calibration Code	3 Alphanumeric characters
	Serial No.	Alphanumeric, up to 8 characters
Engine Left:		
1	Max Ng Norm (K2)	0 to XX.XX, Numeric
1	Ng Cor Factor (K3)	0 to XX.X, Numeric
1	Ng Bias Flt Cor (K4A)	0 to X.XXX, Numeric
1	Ng Bias Alt Flt Cor (K4B)	0 to X.XXX, Numeric
1	Max EGT Norm (K5)	0 to XXX.X, Numeric
1	EGT Cor Factor (K6)	0 to XX.X, Numeric
1	EGT Bias Flt Cor (K7A)	0 to X.XXX, Numeric
1	EGT Bias Alt Flt Cor (K7B)	0 to X.XXX, Numeric
1	Ng Gain Flt Cor (K8)	0 to X.XXX, Numeric
1	EGT Gain Flt Cor (K9)	0 to X.XXX, Numeric
2	Torque Bias	0 to 50
2	Torque Gain	0.000 to 1.000
2	EGT Bias	-50 to 50
2	EGT Gain	0.000 to 1.000
Engine Right:		
1	Max Ng Norm (K2)	0 to XX.XX, Numeric
1	Ng Cor Factor (K3)	0 to XX.X, Numeric
1	Ng Bias Flt Cor (K4A)	0 to X.XXX, Numeric
1	Ng Bias Alt Flt Cor (K4B)	0 to X.XXX, Numeric
1	Max EGT Norm (K5)	0 to XXX.X, Numeric
1	EGT Cor Factor (K6)	0 to XX.X, Numeric
1	EGT Bias Flt Cor (K7A)	0 to X.XXX, Numeric
1	EGT Bias Alt Flt Cor (K7B)	0 to X.XXX, Numeric
1	Ng Gain Flt Cor (K8)	0 to X.XXX, Numeric
1	EGT Gain Flt Cor (K9)	0 to X.XXX, Numeric
2	Torque Bias	0 to 50
2	Torque Gain	0.000 to 1.000
2	EGT Bias	-50 to 50
2	EGT Gain	0.000 to 1.000
3	Top Level Software Part Number	12 Characters
3	Operational Software Part Number	12 Characters
3	Maintenance Software Part Number	12 Characters
3	BMSOP Software Part Number	12 Characters
3	BMSBP Software Part Number	12 Characters
3	BMSBM Software Part Number	12 Characters

Setup Data ID	8 Characters
Setup Data Config Change Time	0 to 23:59, 4 Characters
Setup Data Config Change Date (Mo, Da, Yr)	Numeric, 6 Characters

Cycle Factors:[1]

	ECF	MCF1	MCF2	MCF3	MCF4	MCF5	ACF1	ACF2	ACF3	ACF4	ACF5	FCF	RTCF
Impeller	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	XX.X	XX.X	XX.X	XX.X	XX.X	X.XX	X.XX
Comp Turb	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	XX.X	XX.X	XX.X	XX.X	XX.X	X.XX	X.XX
Power Turb	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	XX.X	XX.X	XX.X	XX.X	XX.X	X.XX	X.XX

Impeller Parameter Thresholds:[1]

	EGT (deg C)		Ng (%)	Ql (%)	Np (%)
Threshold 1	XXX.X	XXX.X	XXX.X	XXX.X	
Threshold 2	XXX.X	XXX.X	XXX.X	XXX.X	
Threshold 3	XXX.X	XXX.X	XXX.X	XXX.X	
Threshold 4	XXX.X	XXX.X	XXX.X	XXX.X	
Threshold 5	XXX.X	XXX.X	XXX.X	XXX.X	

Compressor Turbine Parameter Thresholds:[1]

	EGT (deg C)	Ng (%)	Ql (%)	Np (%)
Threshold 1	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 2	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 3	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 4	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 5	XXX.X	XXX.X	XXX.X	XXX.X

Power Turbine Parameter Thresholds:[1]

	EGT (deg C)	Ng (%)	Ql (%)	Np (%)
Threshold 1	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 2	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 3	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 4	XXX.X	XXX.X	XXX.X	XXX.X
Threshold 5	XXX.X	XXX.X	XXX.X	XXX.X

Cycle Factors:[2]

	Ng(max) Threshold (%)											
	101	**100**	**99**	**98**	**97**	**96**	**95**	**94**	**93**	**92**	**91**	**<=90**
NgK1 Impeller	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX
NgK3 **Comp Turb**	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX

Np(max) Threshold (%)												
	112	**111**	**110**	**109**	**108**	**107**	**106**	**105**	**104**	**103**	**102**	**101**
NpK1 Power Turb	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX
	100	99	98	97	96	95	94	93	92	91	<=90	
NpK1 Power Turb	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	X.XX	

	NgK2	**NgHT**	**NgLT**
Impeller	X.XX	XX %	XX %
	NgK4	**NgHT**	**NgLT**
Compressor Turbine	X.XX	XX %	XX %
	NpK2	**NpHT**	**NpLT**
Power Turbine	X.XX	XX %	XX %

Notes:

1. PWC Cycle Counting

2. Turbomeca Cycle Counting

3. Data reported by IIDS, not changeable from GBMC

Cumulative Log

Date	Dec 19 1990
Time	13:27:46
Aircraft No.	12345678
Number of Flights	2111
Total Flight Time	3056.1
Last Flight Time	1.5
Xmsn Chip Burn Cnts	2

Engine Left: Serial No. 12376

Gear Box Module:

Serial No.	Accum SSO	Accum FSO	Accum TSO	Accum TSN
12345	567	552	1343.1	4020.2

Power Module:

Serial No.	Accum SSO	Accum FSO	Accum TSO	Accum TSN
12354	567	552	1343.1	4020.2

2.5 OEI Excruns	10
Total Time 2.5 OEI	14.7 min
104% Excruns	126
Total Time 104%	1430 min

	Serial No. Accum'd	Total Cycles Last Flt	Cycles Accum'd	Total Hours
Impeller, Centrfgl	234570	7854	2	12898
Disk Comp Turb	234571	6674	1.7	11300
Disk Power Turb	234572	8121	1.9	13234

Engine Right: Serial No. 12367

Gear Box Module:

Serial No.	Accum SSO	Accum FSO	Accum	TSO	Accum TSN
12346	123	112	567.1	567.2	

Power Module:

Serial No.	Accum SSO	Accum FSO	Accum TSO	Accum TSN
12364	123	112	567.1	567.2

2.5 OEI Excurns	15
Total Time 2.5 OEI	4.7 min
104% Excruns	126
Total Time 104%	1430 min

	Serial No.	Total Cycles Accum'd	Cycles Last Flt	Total Hours Accum'd
Impeller, Centrfgl	234570	7854	2	12898
Disk Comp Turb	234571	6674	1.7	11300
Disk Power Turb	234572	8121	1.9	13234

The definitions of the data fields in the Cumulative Log are listed below.

Engine:

	Serial No.	Alphanumeric, up to 12 characters

Gear Box Module:

	Serial No.	Alphanumeric, up to 12 characters
	Time Since New (TSN)	0 to 50,000.0
	Time Since Overhaul (TSO)	0 to 50,000.0
1	Time Between Overhaul (TBO)	0 to 50,000.0
	Starts Since Overhaul (SSO)	0 to 9999
	Flights Since Overhaul (FSO)	0 to 9999

Power Module:

	Serial No.	Alphanumeric, up to 12 characters
	Time Since New (TSN)	0 to 50,000.0
	Time Since Overhaul (TSO)	0 to 50,000.0
1	Time Between Overhaul (TBO)	0 to 50,000.0
	Starts Since Overhaul (SSO)	0 to 9999
	Flights Since Overhaul (FSO)	0 to 9999
	2.5 OEI Excursions	0 to 999
	Accum 2.5 OEI Time	0 to 999
	104% Excursions	0 to 999
	Accum 104% Time	0 to 999

	Serial No.	**Accum Life Cycles**	**Hours**
Impeller, Centrifugal	12 Char	6 Char	6 Char
Disk, Compressor Turbine	12 Char	6 Char	6 Char
Disk, Power Turbine	12 Char	6 Char	6 Char

Notes:

1. Turbomeca only

Data Log

	Parameter	**Recording Rate**
3	Gas Generator Speed, Ng, % (Left/Right)	4 per second
	Power Turbine Speed, Np, % (Left/Right)	4 per second
	Rotor Speed, Nr, %	4 per second
2	Torque Local, Ql, % (Left/Right)	4 per second
2	Exhaust Gas Temp, EGT, Deg C (Left/Right)	4 per second
1	Collective Posn, CLP, %	4 per second
	Engine Oil Temp, EOT, Deg C (Left/Right)	1 per second
	Engine Oil Press, EOP, PSI (Left/Right)	1 per second
	Transmission Oil Temp, XOT, Deg C	1 per second
	Transmission Oil Press, XOP, PSI	1 per second
	Generator Load, % (Left/Right)	1 per second
	Battery Bus Voltage	1 per second

Hydraulic Oil Press, HOP, PSI (1/2)	1 per second
Aircraft Discrete Input Data	1 per second
Outside Air Temp, OAT, Deg C	1 per second
Pressure Altitude, P0, feet	1 per second

Notes:
1. Data on RS-422 serial bus
2. Data on RS-422 serial bus for PWC and analog input for TEC
3. Corrected Ng for Turbomeca

Fault Log

Fault Log Number		12
Aircraft No.		12345678
Engine Left S/N	12345	
Engine Right S/N		12346
Date		Dec 19 1990
Time		13:27:46
IIDS Fault Words:		IIDSFALT1
		IIDSFALT2
Aircraft Fault Word		ACFTFALT
Sensor Fault Word		SENSFALT
BMS Fault Word		BMSFALT

Pratt & Whitney:

Engine Left EEC Fault Words:	DSCWD1, NCFAL1, NCFAL2, NCFAL3, CFAIL
Engine Right EEC Fault Words:	DSCWD1, NCFAL1, NCFAL2, NCFAL3, CFAIL

OR

Turbomeca:

Engine Left EEC Fault Words:	MAINTENANCE 1, 2; LOGICAL INPUT, OUTPUT
Engine Right EEC Fault Words:	MAINTENANCE 1, 2; LOGICAL INPUT, OUTPUT

Trend Log

PRATT AND WHITNEY:

		Trend Log Number
	*	TIME
	*	DATE (MMDDYY)
		Engine Left or Right
3	*	Engine Serial Number
	*	Engine TSO
	*	Np (Power Turbine Speed)
1		T1 (Inlet Temperature)
1	*	Torque (Qt)
1	*	Ng (Gas Generator Speed)
1	*	EGT (Exhaust Gas Temperature)
		EOP (Engine Oil Pressure)
		EOT (Engine Oil Temperature)
		Nr (Rotor Speed)
		XOP (Transmission Oil Pressure)
		XOT (Transmission Oil Temperature)
		HOP 1/2 (Hydraulic Oil Pressure)
	*	P0 (Pressure Altitude in feet)
	*	Outside Air Temp (OAT)
2	*	Ng Performance Margin
2	*	EGT Performance Margin
3		Ng correction factor from Initial Calibration (K3)
3		EGT correction factor from Initial Calibration (K6)

**** Data in Standard (STD) File to HECTM™***

Exceedance Log

Exceedance Log Number	35
Exceedance Parameter Type	Left Eng Torque
Aircraft No.	12345678
Engine Left S/N	12345
Engine Right S/N	*N/A*
Date	Dec 19 1990
Time	13:27:46
Peak Value	120%
Time to Peak	23 Sec
Time above 88.4%	54 Sec
Time to 100%	8 Sec
Time above 100%	45 Sec
Time to 102.57%	6 Sec
Time above 102.57%	31 Sec
Time to 113.97%	10 Sec
Time above 113.97%	15 Sec
Data Log File Number	3

BMS Log Definition Tables

BMS Setup Log

PARAMETER	OCCURRENCES	RANGE
Spectrum Log Type	One per Log Type	Trend, Random, or PA
Log Version	One per Log Type	6 alphanumeric characters
Log Name	One per Log Type	10 alphanumeric characters
Set Number	One per Set in Log	1 to 99
Set Name	One per Set in Log	12 alphanumeric characters
Low Frequency	One per Group in Set	Must be zero Hz
High Frequency	One per Group in Set	Hz (10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000)
Number of Averages	One per Group in Set	1 to 32
Number of Bins	One per Group in Set	400
Azimuth Channel	One per Group in Set	1 to 7
Signal Conditioning	One per Group in Set	AC, DC, DC Attenuated
Window Type	One per Group in Set	Flattop only
Output Scale Factor	One per Group in Set	10^{-3} only
Output Units	One per Group in Set	IPS only
Spectrum Number	One per Spectrum in Group	1 to 999
Spectrum Name	One per Spectrum in Group	12 alphanumeric characters
Vibration Channel	One per Spectrum in Group	1 to 13

Vibration/Balance Model Log

Vibration Monitor Setup Parameters:

PARAMETER	RANGE
Vibration Monitor Version	6 alphanumeric chars
Main Rotor Level 1 Trigger Level	0 to 32 IPS
Main Rotor Level 1 Trigger Time	0 to 32,000 seconds
Store data on MR Level 1 Alarm	Yes or No
Notify IIDS on MR Level 1 Alarm	Yes or No
Main Rotor Level 2 Trigger Level	0 to 32 IPS
Main Rotor Level 2 Trigger Time	0 to 32,000 seconds
Store data on MR Level 2 Alarm	Yes or No
Notify IIDS on MR Level 2 Alarm	Yes or No
NOTAR Level 1 Trigger Level	0 to 32 IPS
NOTAR Level 1 Trigger Time	0 to 32,000 seconds
Store data on NOTAR Level 1 Alarm	Yes or No
Notify IIDS on NOTAR Level 1 Alarm	Yes or No
NOTAR Level 2 Trigger Level	0 to 32 IPS
NOTAR Level 2 Trigger Time	0 to 32,000 seconds
Store data on NOTAR Level 2 Alarm	Yes or No
Notify IIDS on NOTAR Level 2 Alarm	Yes or No

Main Rotor Balance Model Parameters:

PARAMETER	OCCURRENCES	RANGE
Change Type Name	One per Change Type	xx alphanumeric chars
Change Type Max Value	One per Change Type	floating point number
Change Type Min Value	One per Change Type	floating point number
Change Type Constrained	One per Change Type	Yes or No
Change Type Editable	One per Change Type	Yes or No
Change Type Cost Factor	One per Change Type	floating point number
Balance Point Name	One per Balance Point	xx alphanumeric chars
Flight Regime Name	One per Flight Regime	xx alphanumeric chars
Azimuth Channel Number	One per Flight Regime	1 to 7
Measurement Name	One per meas in regime	xx alphanumeric chars
Harmonic (nP) Number	One per meas in regime	1 to 4
Vibration Channel Number	One per meas in regime	1 to 13
Component RPM	One per meas in regime	60 to 300,000 RPM
Change Sensitivity	One per blade per meas	floating point number
Change Phase Angle	One per blade per meas	0 to 360 degrees
Initial Vibration Goal	One per meas in regime	floating point number
Vibration Goal Increment	One per meas in regime	floating point number

NOTAR Balance Model Parameters:

PARAMETER	OCCURRENCES	RANGE
Change Type Name	One Change Type (weight)	xx alphanumeric chars
Change Type Max Value	One Change Type (weight)	floating point number
Change Type Min Value	One Change Type (weight)	floating point number
Change Type Constrained	One Change Type (weight)	Yes or No
Change Type Editable	One Change Type (weight)	Yes or No
Change Type Cost Factor	One Change Type (weight)	floating point number
Balance Point Name	One per Balance Point	xx alphanumeric chars
Flight Regime Name	One Flight Regime (100% Gnd)	xx alphanumeric chars
Azimuth Channel Number	One Flight Regime (100% Gnd)	1 to 7
Measurement Name	One meas in regime	xx alphanumeric chars
Harmonic (nP) Number	One meas in regime	1 to 4
Vibration Channel Number	One meas in regime	1 to 13
Component RPM	One meas in regime	60 to 300,000 RPM
Change Sensitivity	One per blade per meas	floating point number
Change Phase Angle	One per blade per meas	0 to 360 degrees
Initial Vibration Goal	One Only	floating point number
Vibration Goal Increment	One Only	floating point number